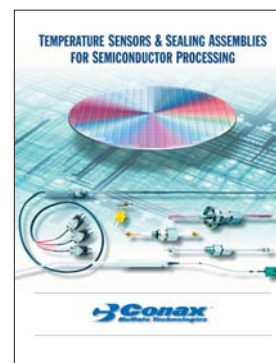
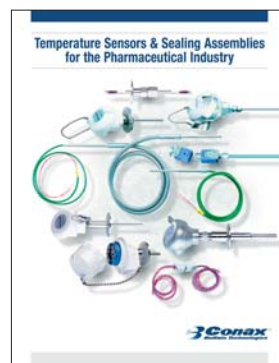
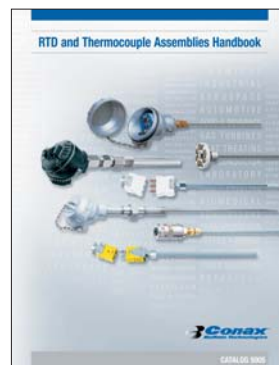


CALL US OR VISIT OUR WEBSITE TO REQUEST OTHER CONAX BUFFALO CATALOGS:



Standard sealing assemblies are generally available from stock. Unlimited custom designs are available for virtually any probe or wire sealing application.

For more information and for assistance with gland selection and application engineering advice, contact your Conax® Buffalo Technologies representative.

THE EXPERIENCE AND INGENUITY TO MEET ANY APPLICATION REQUIREMENTS...

The standard ranges of sealing assemblies shown in this brochure can be customised through the use of other materials for gland bodies, the choice of special sealant materials and by specifying optional mounting and cap threads.

In addition to these variations we also design glands for non-threaded mounting. In most cases, our wide variety of off-the-shelf products can be adapted to meet the needs of your application.

For those truly unique requirements and for specific applications where standard glands, or modified versions, cannot meet customers' specifications, our engineers are ready to put more than 50 years of experience to work designing the perfect solution for your application. Many of our custom designs are now industry standards.

Our knowledgeable, experienced staff would welcome the opportunity to discuss your application and recommend solutions.

Conax®
Buffalo Technologies



thermo-electra

measurement and control technics

2300 Walden Avenue
Buffalo, New York 14225, USA
Fax: 1-716-684-7433 • Phone: 1-716-684-4500
Toll free in the USA at 1-800-223-2389

P.O. box 73
2640 AB Pijnacker, The Netherlands
Phone: +31 15 362 12 00
Fax: +31 15 369 40 82
E-mail: mail@thermo.nl
Internet: www.thermo-electra.com



Conax®
Buffalo Technologies

The complete guide to PRESSURE AND VACUUM SEALING ASSEMBLIES



Teflon and Kapton are registered trademarks of E I Du Pont de Nemours Company • Viton is a registered trademark of DuPont Dow Elastomers LLC
Grafoil is a registered trademark of the UCAR Carbon Company

THE COMPLETE SEALING GLAND CATALOGUE

Contents

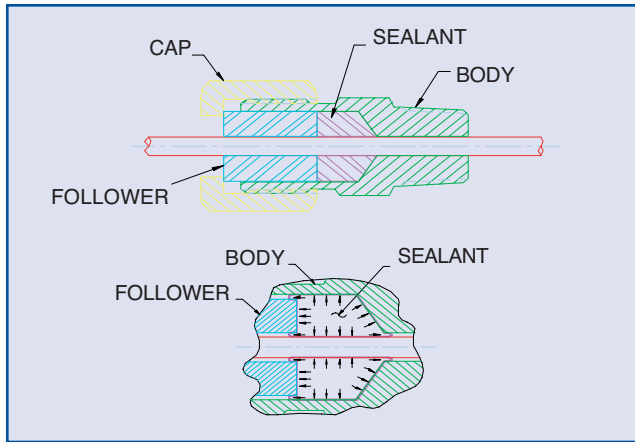
Product Directory	Pages 2-5
Sealing Gland Selection Guide	Pages 6-9
PG glands - for single sensors and probes	Pages 10-11
MK glands - for single tubes or probes	Pages 12-13
EG and EGT glands - with integral, single electrodes for high voltage and current	Pages 14-15
MHC glands - for multiple sensors and probes	Pages 16-17
MHM glands - for non-standard sizes and custom configurations of multiple elements	Pages 18-19
PL glands - for sealing insulated wire	Pages 20-21
TG glands - for sealing multiple bare wires	Pages 22-24
BSWS seals - Bearing sensor wire seals	Page 25
PGS, SPG and DSPG glands - with split internal components for multiple elements	Pages 26-27
FSA assemblies - Fibre optic seal assemblies	Pages 28-29
HD assemblies - High density, insulated wire feedthrough assemblies	Pages 30-31
High Pressure Sealing Assemblies	Page 32
Custom sealing assemblies	Pages 33-34
Accessories	Page 35
Assembly instructions	Pages 36-41
Conversion data - wire sizes and operating parameters	Page 41
Gland threads and materials, vacuum rating	Page 42

The following trademarks are used in this catalogue:
Teflon is a registered trademark of E I Du Pont de Nemours
Viton is a registered trademark of DuPont Dow Elastomers LLC
Grafoil is a registered trademark of the UCAR Carbon Company
Kapton is a registered trademark of E I Du Pont de Nemours
Hastelloy is a registered trademark of Hayes Intl.
Monel is a registered trademark of INCO
Chromel-Alumel is a registered tradename of Hoskins Manufacturing

Conax® Buffalo Technologies has a policy of continuous improvement. Specifications may be subject to change without notice.

AN INTRODUCTION TO PRESSURE AND VACUUM SEALING ASSEMBLIES 'SOFT' SEALANTS AND THEIR CHARACTERISTICS

Conax® Buffalo Technologies manufactures a complete line of pressure and vacuum sealing gland assemblies to carry probes, sensors, wires, electrodes and other elements, satisfying diverse application requirements across a broad spectrum of industries.



The plastic deformation of a sealant material within a fixed housing is the fundamental concept of the Conax® sealing technology. The application of this concept, with a thorough understanding of the behaviour of sealant materials, has resulted in a range of assemblies with unequalled adaptability.

When an element (probe, sensor, electrode etc.) is inserted in a gland and the cap is torqued to the recommended setting, the torque on the cap translates an axial force on the follower which compresses or crushes the sealant that is contained within the body thus creating a seal on the element. Tension in the body acts like a spring to maintain compression; friction between the sealant and the element restrains the element from moving under pressure or vacuum.

The five standard sealant materials and some selected special sealants are listed on the following page with their properties and characteristics.

PROVEN PERFORMERS

Conax® Buffalo Technologies developed the "soft sealant" method of pressure/vacuum sealing in the 1950s and remains the leading manufacturer of this type of sealing device. This "soft sealant" technology maintains a secure seal on wires, probes and electrodes that must pass through a pressure or environmental boundary while still allowing ease of installation, adjustment and replacement of these elements.

Based on the compression of a sealant material within a fixed housing, the practical application of this technology relies on a thorough understanding of the behavior of sealant materials. Conax® Buffalo Technologies continues to research and perfect this knowledge as we expand our capabilities to meet the changing needs of industry worldwide.

Conax® Buffalo Technologies offers a complete range of pressure/vacuum sealing gland options to seal everything from a single element up to 240 wires through a single gland. We offer assemblies to accommodate bore sizes ranging from 1mm to 1-1/2" pipe, and pressures from vacuum to 2070 bar.

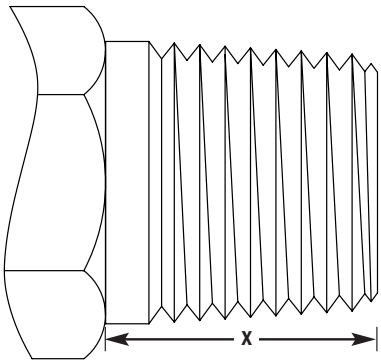
In the past 50 years, Conax® Buffalo Technologies has developed a reputation as the company to turn to for quality solutions to application needs. Our knowledgeable, multi-disciplinary sales and engineering staff welcomes the opportunity to discuss challenging applications and present solutions.

From a simple "off-the-shelf" assembly to the most complicated design challenge, turn to Conax® Buffalo Technologies for quality, innovation, on-time delivery and commitment to customer satisfaction.



GLAND THREADS AND MATERIALS, PRESSURE AND VACUUM RATING GUIDES, GENERAL INFORMATION FOR SPECIFIERS

NPT (NATIONAL PIPE THREAD) SIZES



The standard threadform for Conax glands, for both mounting threads and conduit threads on type B caps, is NPT (National Pipe Tapered thread) to USAS B2.1 (1968). The following table lists the key dimensions for each size of thread used on Conax sealing glands.

Size (NPT)	Nominal OD (mm)	Length 'x' (mm)	Nominal thread engagement (mm)
1/16	7.925	9.90	6.10
1/8	10.29	9.90	6.60
1/4	13.72	14.98	10.16
3/8	21.34	19.81	12.70
1/2	26.67	20.07	13.72
3/4	33.40	24.89	17.27
1 1/4	42.16	25.65	18.03

OTHER MOUNTING AND CAP THREADS

Conax glands can be supplied with other threadforms:

- BSPT - BS 21 - DIN 2999 ISO 7/1 - JIS B0203 (tapered)
- BSPP - BS 2779 - DIN ISO 228 - JIS B0202 (parallel)
- ISO Metric - M10 to M42 (parallel)
- SAE AS4395 style E (parallel)

Parallel mounting threads use an 'O'-ring or a compression gasket seal at the base of the thread (not supplied with glands).

Undercuts to DIN 3852 may also be specified.

Caution: Pressure and vacuum ratings for glands with other threads may not be the same as quoted for glands with NPT threads. Please consult Conax Buffalo Technologies.

GLAND BODY MATERIALS

Conax pressure and vacuum sealing gland component parts are manufactured in the following standard materials:

- 316L stainless steel (1.4404¹⁾ – SS2348²⁾ Z 2 CND 17.12³⁾)
- 303 stainless steel (1.4305 - SS2346 - Z 10 CNF 18.09) (Anti-rotation pins in multi-element glands are made in 304SS (1.4301 - SS2332 - Z 6 CN 18.09)

Glands may also be specified with bodies manufactured in:

- Hastelloy C276
- Monel 405
- Other stainless grades and Carbon (mild) steel (to special order).

1) Werkstoff Nr, (Germany) 2) Swedish Standard 3) AFNOR (Franco)

The following types of glands are available as standard items with 316SS bodies and are compliant with NACE (National Association for Corrosion Engineers) International Standard MR0175-96 for metallic materials in contact with sour environments: PG, MHC, MHM (body and seat 316), EG, EGT, PL and TG. Caps and followers of all of these glands are 303SS or 316L.

PG glands are available as standard items with Hastelloy C276 or Monel 405 bodies (caps and followers made in 303SS or 316L).

PRESSURE RATINGS

Pressure rating guide values for glands with elements restrained by the sealant only. Higher pressures may possibly be attained by additional element restraint. Please consult Conax for advice. Stub elements to close unused holes in sealants **must be restrained** to prevent ejection under pressure.

All pressure and vacuum ratings are determined at 20° C using elements appropriate to the gland type. Ratings may vary according to temperature and sealant material. The ratings shown in the specification tables are for guidance only. Please consult Conax for advice.

EUROPEAN PRESSURE DIRECTIVE (PED)

Conax Buffalo sealing gland assemblies up to 25.4 mm bore conform to the Standard Engineering Practice (SEP) requirements of the European Pressure Equipment Directive (PED) 97/23/EC. Contact Conax Buffalo for further information.

Glands with Neoprene, Viton, Teflon and Grafoil sealants are rated for use to 6.67 x 10⁻⁴ Pa (6.67 x 10⁻⁶ mbar).

Glands with Lava sealants are generally not recommended for use in vacuum applications.

Sealant Material (Sealant Code) [Colour]	Temperature range	Type of Material	Features
Neoprene (N) [Green - previously Black]	-40° to +93°C	Synthetic rubber (Polychloroprene) nonflammable	Has the resilience of natural rubber but with better resistance to oil, petrol, ozone, weather and heat. Excellent physical 'memory' for temperature cycling applications, moderate electrical resistivity. Reusable in most cases.
Viton (V) [Brown]	-20°C to +232°C	Fluoroelastomer nonflammable	Retains its mechanical properties at high temperatures. Resistant to oils, solvents, fuels and corrosive industrial chemicals. Reusable in most cases.
Teflon (T) [White]	-185°C to +232°C	Tetrafluoroethylene (Thermoplastic resin) nonflammable	Least permeable to gases. Has a natural lubricity. Resists the adhesion of foreign matter. Reusable in most cases.
Lava (L) [Grey mixture]	-185°C to +870°C	Natural Magnesium Silicate (Soapstone)	Low thermal co-efficient, good electrical resistivity. Crushes to a powder under compression. Slightly porous to light gases and steam. NOT RECOMMENDED FOR VACUUM APPLICATIONS. Not reusable.
Grafoil (G) [Silver Grey]	-240°C to +495°C (to +1650°C in a reducing/inert atmosphere)	Graphite (99.5%) in foil layers (UCAR Carbon Co. Grafoil grade GTA-J)	Low vapour pressure, low gas permeability - excellent for vacuum applications. Natural lubricity. Electrically conductive. Excellent sealing capabilities at +495°C. Not reusable in most cases.
Boron Nitride (H) [White]	-20°C to +982°C (to +2800°C in a reducing/inert atmosphere)	Hot pressed Boron Nitride	Excellent electrical characteristics and ability to withstand chemical attack. Not reusable.
Vespel (VESP) [Brown]	-240°C to +288°C For short periods to +440°C	Polyimide	Excellent electrical characteristics. Maintains mechanical properties at elevated temperatures. NOT FOR USE IN STEAM. Reusable in most cases.

Pressure and vacuum sealing glands

- Are used when probes and other elements must pass through a pressure or environmental boundary.
- Maintain the integrity of the seal at the point of feedthrough penetration.
- Employ 'soft' sealant technology so that probes can be adjusted, removed and replaced yet are not deformed during installation.
- Satisfy pressure, vacuum and environmental sealing applications in many industries - from process control and power generation to semi-conductor fabrication and steel production.
- Frequently reduce the overall cost of ownership, when compared with other sealing techniques, through reductions in installation time, downtime and the cost of replacement parts.

There are 10 types of pressure and vacuum sealing glands. There are also a number of assemblies that are configured for specific applications, e.g., for multiple wire and optical fibre feedthroughs.

Specifications and ratings for each type are included in this catalogue.

Standard sealing assemblies are generally available from stock and unlimited custom designs are available for virtually any probe or wire sealing application.

A brief description and typical applications for each gland assembly is shown on the next pages to help you to pin-point the most suitable gland for your application.

For assistance with gland selection and for technical and application engineering advice contact your Conax® Buffalo Technologies representative or our offices in the USA. Postal, E-mail and web site addresses, phone and fax numbers are shown on the back cover.

Single sensor and probe glands for elements 1.0mm (0.040") to 25.4mm (1.00") dia. - PG glands - pages 10 & 11



Probe sealing glands are excellent for applications such as single, sheathed thermocouples, resistance thermometers, thermistor probes and other types of sensors. They are easily assembled by simply inserting the sensor element and torquing the cap.

Single sensor and probe glands for elements 25.4mm (1.00") to 44.45mm (1.75") dia. - PG glands - pages 10 & 11



Flange Style

Probe sealing glands are excellent for applications such as single, sheathed thermocouples, resistance thermometers, thermistor probes and other types of sensors. They are easily assembled by simply inserting the sensor element and torquing the flange bolts.

Multiple sensor and probe glands for elements 0.5mm (0.020") to 3.2mm (0.125") dia.- MHC glands- pages 16 & 17.



MHC glands enable multiple thermocouples, thermistor probes, RTD's, tubes or other sensors to pass through a single gland. Each probe is electrically isolated and its immersion length is adjustable. Elements may be individually adjusted, removed and replaced.

Multiple sensor and probe glands, for non-standard sizes and custom configurations - MHM glands - pages 18 & 19



MHM glands can often be used when other types of probe glands are not suitable - they can be customised to accommodate non-standard sizes and a mixture of element sizes, for special hole patterns and for a higher density of elements than can be accommodated by other types of sealing assemblies.

Metal to metal tube and probe sealing.- MK glands - pages 12 & 13.



MK Midlock Glands seal a single tube or probe. Featuring a metal-to-metal seal rather than our standard soft sealant technology, MK glands are used where a joint must be opened and resealed in the same setting. Their unique design forms the seal well within the body housing to provide superior performance in high vibration applications.

Single and multiple sensor glands with split internal components - PGS, SPG & DSPG glands - pages 26 & 27.



These glands are used when the elements to be sealed can pass through the gland body but not through the internal components. Their process ends may be of a larger diameter than at the sealing point, there may be connectors to pass through the gland, elements may be long and difficult to handle, or, there are other installation constraints.

Single electrode with ceramic insulators - EG glands; and with Teflon insulator/sealant - EGT glands - pages 14 & 15.



These single conductor sealing glands are used for high voltage and/or high current feedthroughs to vacuum chambers, autoclaves, transformers, motor enclosures, reactor vessels and environmental chambers.

EG glands are available with a choice of sealants and have ceramic insulators. Max.rating 2kV/400A.

EGT glands employ a single-piece, Teflon, combined insulator/sealant component to surround the electrode. Max.rating 8kV/525A.

Copper, Nickel or Stainless Steel electrodes may be specified.

Bare wire sealing and insulated wire sealing - TG glands - pages 22 to 24.

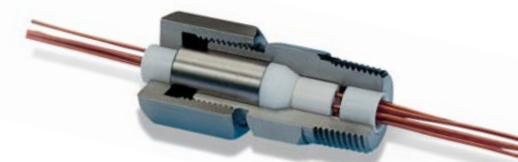


TG glands seal multiple bare wires in a range of wire sizes. They can be used for solid bare wire transducers such as thermocouples, strain-gauges, thermistors, resistance element leads and low voltage-low current supply and signal wires to instrumentation.

The same glands can also be specified as complete assemblies, ready for installation, with fiberglass insulated thermocouple wire for applications reaching up to 482°C.

The same glands can also be specified as complete assemblies, ready for installation, with 24 AWG size Teflon insulated thermocouple material or copper wires. Applications for this variant include sealing of wires exiting compressor bearing housings, pressure vessels and instruments.

Insulated wire sealing - PL glands - pages 20 & 21



These power lead glands have Kapton insulated copper wire in a number of wire sizes. They are used to feedthrough power leads to autoclaves and sterilisers, transformers, motors and heaters. Wires are individually marked at both ends and are easily installed or replaced.

Bearing sensor wire seals - BSWS - page 25



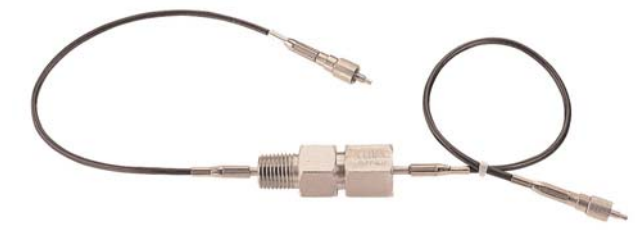
Bearing sensor wire sealing assemblies efficiently seal directly on to the insulated leads of an embedded temperature sensor exiting an oil-filled bearing housing to prevent oil wicking along the leads. They are suitable for motors, turbines, pumps and journal bearing pedestals.

High density, mechanically sealed, wire feedthroughs using single or multiple probe glands - HD - pages 30 & 31

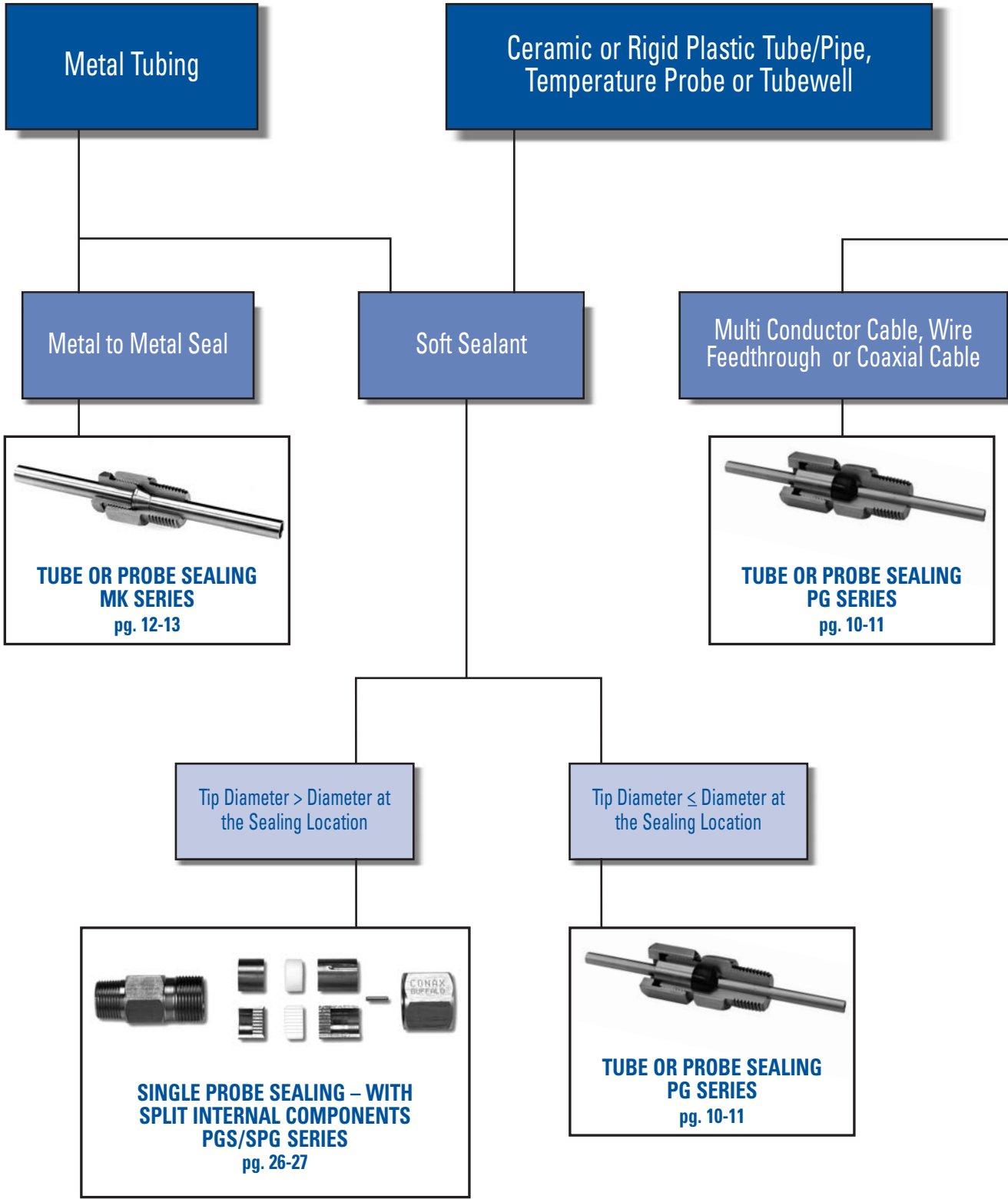


These feedthrough assemblies comprise a high-density, wire feedthrough mounted in a sealing gland. A Teflon-lined, stainless steel tube is swaged over 12, 24, 40 or 60, solid, Teflon-coated, copper and/or thermocouple material wires to make the continuous wire feedthrough for thermocouples, RTD's and low voltage instrumentation.

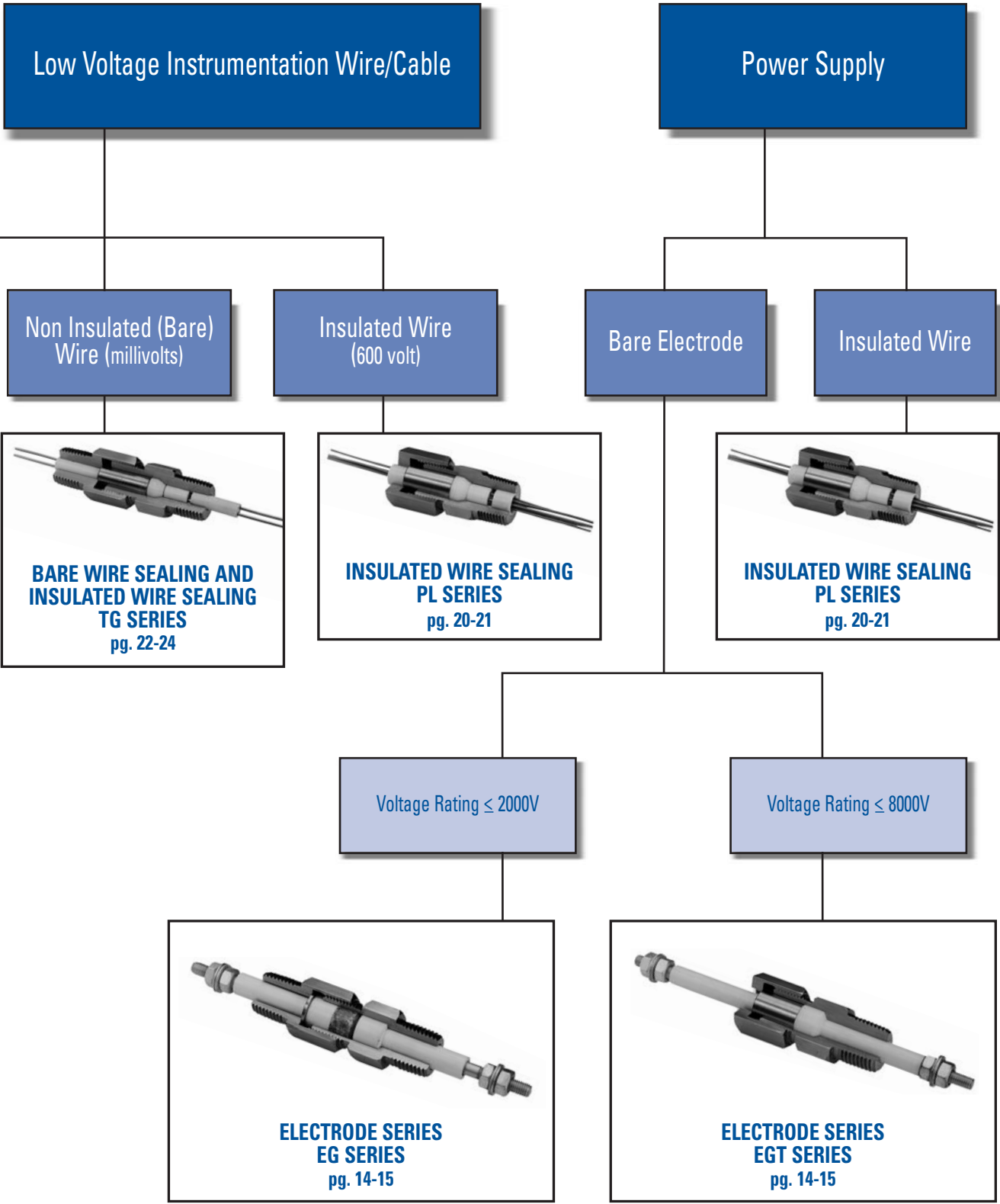
Fibre Optic seal assemblies for sealing on optical fibre cables FSA - pages 28 & 29



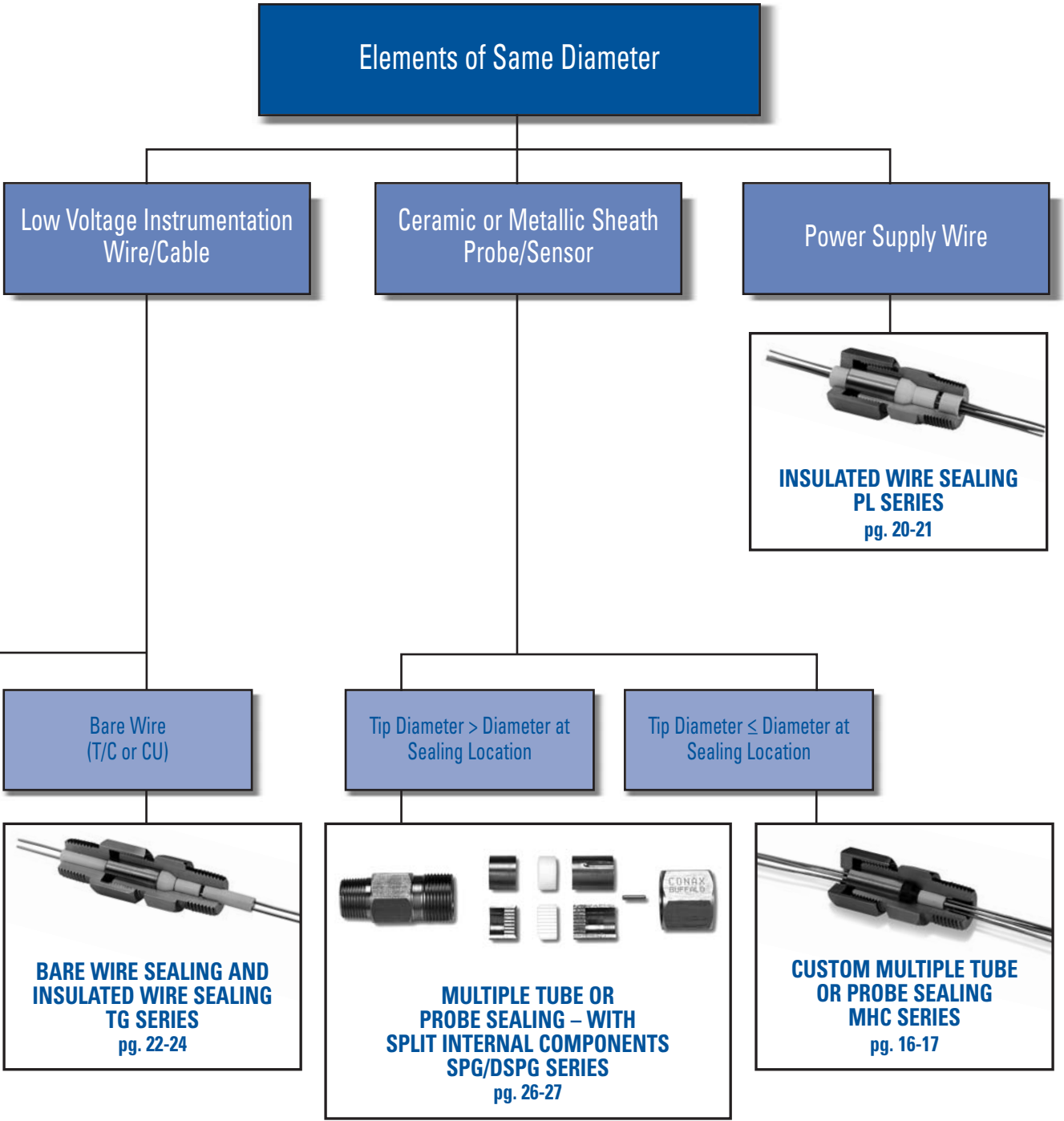
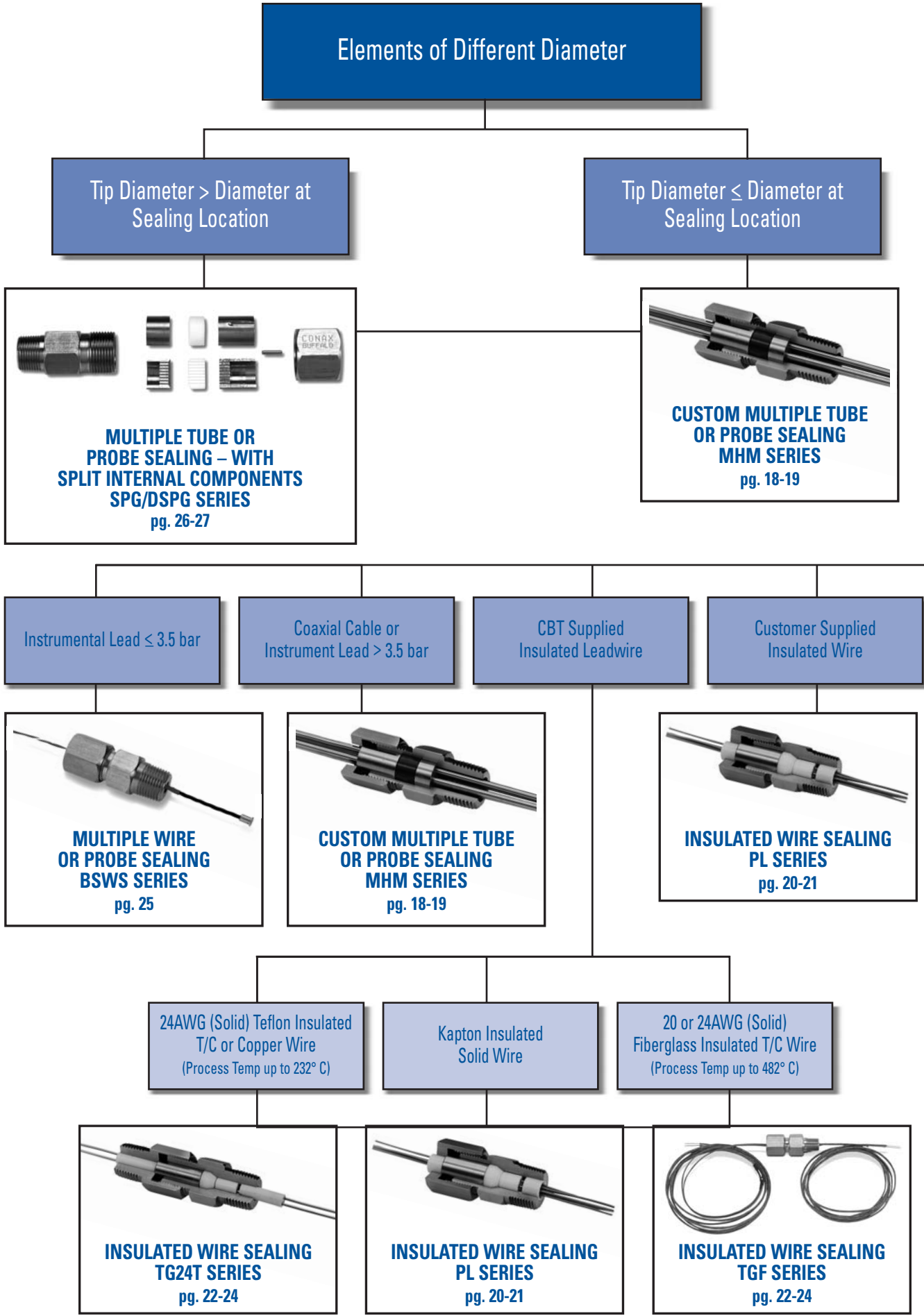
FSA optical fibre sealing assemblies enable a range of sizes of fibre optic cable to pass through environmental boundaries. Fibres are housed in individual, protective stainless steel tube seals. These may be supplied as complete integral assemblies, with connectors if required, in standard pressure and vacuum sealing glands.

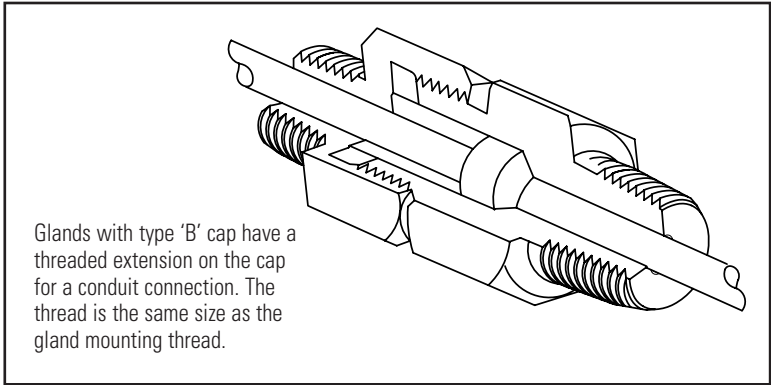
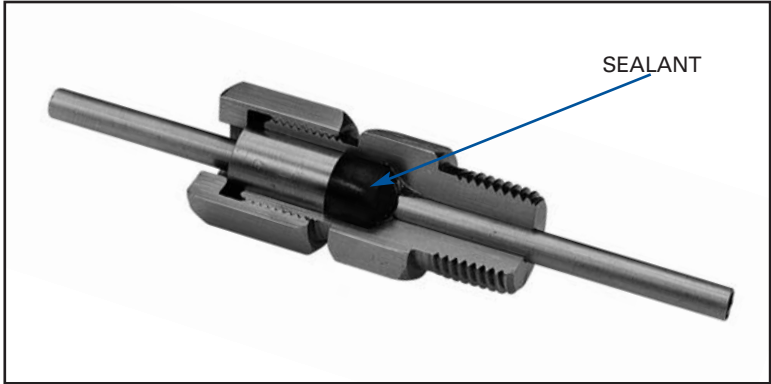


For High Performance Applications:
High Pressure (> 690 bar) **HP SERIES Page 32**



For High Performance Applications:
High Density Wire Feedthrough (up to 240 conductors) **HD SERIES Page 30-31**





Glands with type 'B' cap have a threaded extension on the cap for a conduit connection. The thread is the same size as the gland mounting thread.

PG glands are designed for sealing a single element, usually a tube or probe, where it crosses a pressure or environmental boundary. Glands are available to carry elements in both metric and inch sizes from micro-probes of 1.0mm (0.040") dia. to tubes and pipes of 44.45mm (1.75") dia.

Applications for PG glands include:
Pressure and vacuum sealing of thermocouples, RTD's, dial-type thermometers, thermistor probes, glass thermometers, thermowells (pockets) - including those made from fragile materials, capillary tubes and other sensor elements.

PG gland parts are manufactured from Stainless Steel AISI grades 316L (W.-Nr. 1.4404) and 303 (1.4305). Other materials, 316SS (NACE), Hastelloy C276, Monel 405 are available.

Installation information and torque settings for glands are shown in the Assembly Instructions, see pages 36 to 41.

DIMENSIONS

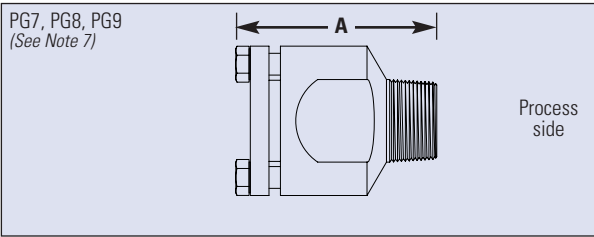
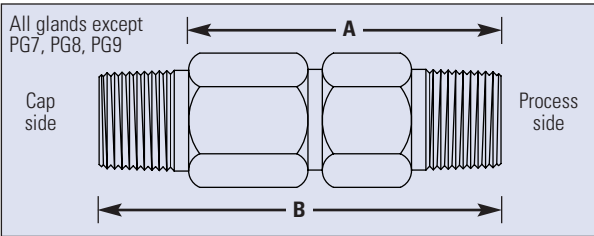
Size of gland	Gland mounting thread (NPT)	Body Hex size (in.)	Cap Hex size (in.)	Length of gland with type A cap Dim. A (mm)	Length of gland with type B cap Dim. B (mm)
MIC	1/16"	1 1/2	1 1/2	23.81	-
MPG	1/8"	1 1/2	1 1/2	30.16	39.69
PG2	1/4"	3/4	3/4	50.80	60.33
PG4	1/2"	1	1	63.50	82.55
PG5	3/4" & 1"	1 1/4	1 1/4	73.03	92.08
PG6	1"	1 3/4	2	88.90	114.30
PG7	1 1/4"	76.20mm dia.		95.25	127.00
PG8	1 1/2"	101.60mm dia.		108.00	-
PG9	2"	127.00mm dia.		128.58	-

- **SEALS A SINGLE ELEMENT - USUALLY A TUBE, PROBE OR SENSOR**
- **FOR GAS OR LIQUID APPLICATIONS**
- **PRESSURE: Vacuum to 690 bar**
- **TEMPERATURE: -240°C to +870°C**
- **FIELD ADJUSTABLE**
- **REPLACEABLE SEALANT FOR REPEATED USE OF FITTING**
- **STAINLESS STEEL BODY, CAP AND FOLLOWER**
- **SIMPLE ASSEMBLY - INSERT ELEMENT, TORQUE CAP**

Conax pressure and vacuum sealing assemblies can be specified for use in a range of temperature, pressure and environmental situations by choosing a sealant that is suitable for the application. Replacement sealants are available to enable repeated use of fittings.

SEALANT SELECTION GUIDE

Sealant (Sealant Code)	Temperature range	Pressure range @ 20°C
Neoprene (N)	-40°C to +93°C	Vacuum to 345 bar
Viton (V)	-20°C to +232°C	Vacuum to 690 bar
Teflon (T)	-185°C to +232°C	Vacuum to 220 bar
Lava (L)	-185°C to + 870°C	1bar to 690 bar
Grafoil (G)	-240°C to +495°C (to +1650°C in a reducing atmos.)	Vacuum to 690 bar



SPECIFICATIONS, ORDERING INFORMATION

Diameter of element to be sealed (See note 2) mm		Gland mounting thread (NPT) (See note 4)	Gland Description [Order Code] (See notes 1 & 4)	Pressure rating by sealant (bar) (See notes 3, 5 & 6)				
				Neoprene (N)	Viton (V)	Teflon (T)	Lava (L)	Grafoil (G)
1.0	0.040	1/16"	MIC - 040 - A - **	-	-	220	550	-
		1/8"	MPG - 040 - A - **	138	110	110	193	110
1.5	0.062	1/16"	MIC - 062 - A - **	-	-	220	550	-
		1/8"	MPG - 062 - * - **	110	193	110	220	140
	0.093	1/8"	MPG - 093 - * - **	85	85	55	140	165
3.0		1/8"	MPG - 118 - * - **	85	85	55	140	165
		1/4"	PG2 - 118 - * - **	345	690	220	690	690
	0.125	1/8"	MPG - 125 - * - **	85	85	55	140	165
		1/4"	PG2 - 125 - * - **	345	690	220	690	690
	0.187	1/8"	MPG - 187 - * - **	85	100	100	140	55
		1/4"	PG2 - 187 - * - **	220	310	165	690	345
6.0		1/4"	PG2 - 236 - * - **	165	205	80	690	275
		1/2"	PG4 - 236 - * - **	100	100	165	690	345
	0.25	1/4"	PG2 - 250 - * - **	110	110	30	635	275
		1/2"	PG4 - 250 - * - **	100	100	165	690	345
		3/4" or 1"	PG5 - 250 - * - **	100	100	165	690	345
8.0	0.312	1/2"	PG4 - 312 - * - **	80	80	135	690	345
	0.375	1/2"	PG4 - 375 - * - **	80	35	95	690	220
		3/4" or 1"	PG5 - 375 - * - **	60	60	100	345	165
	0.5	3/4" or 1"	PG5 - 500 - * - **	60	60	100	345	165
	0.625	3/4" or 1"	PG5 - 625 - * - **	55	55	55	275	165
	0.75	3/4" or 1"	PG5 - 750 - * - **	55	55	55	275	165
21.34	1/2" pipe	1"	PG6 - 840 - * - **	-	69	27.5	-	-
21.34	1/2" pipe	1 1/4"	PG7 - 840 - * - **	-	69	-	34	51
	0.875	1"	PG6 - 875 - * - **	-	69	27.5	-	-
	1.0	1	PG6 - 1000 - * - **	-	69	27.5	-	-
		1 1/4"	PG7 - 1000 - A - **	-	69	-	34	51
	1.05	1 1/4"	PG7 - 1050 - A - **	-	69	-	34	51
31.75	1.25	1 1/4"	PG7 - 1250 - A - **	-	69	-	34	51
31.75	1.25	1 1/2"	PG8 - 1250	-	See Note 6			
38.1	1.50	1 1/2"	PG8 - 1500	-				
		2"	PG9 - 1500	-				
44.45	1.75	2"	PG9 - 1750	-				

NOTES

Note 1:
The Gland Description [Order Code] shown in the table is completed by selecting the type of cap required - A or B is inserted at *. (MIC, PG8, and PG9 - type B not available). The code letter for the sealant selected is inserted at **. (See opposite page for sealant information)

Example: PG2-118-A-N describes a PG2 size gland (1/4" NPT mounting thread) suitable for a 3.0mm dia. element, with type A cap and Neoprene sealant. Replacement Sealant Order Code Example: RS-PG2-118-N

Note 2:
Tolerance of tube or probe diameter ±0.127mm (0.005"). Deviation from the nominal may affect pressure ratings.

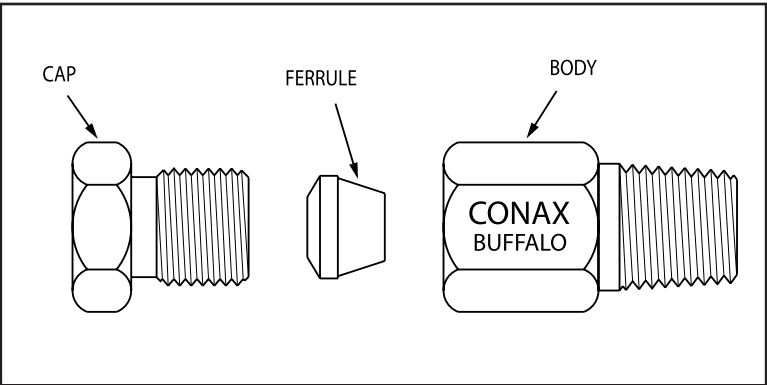
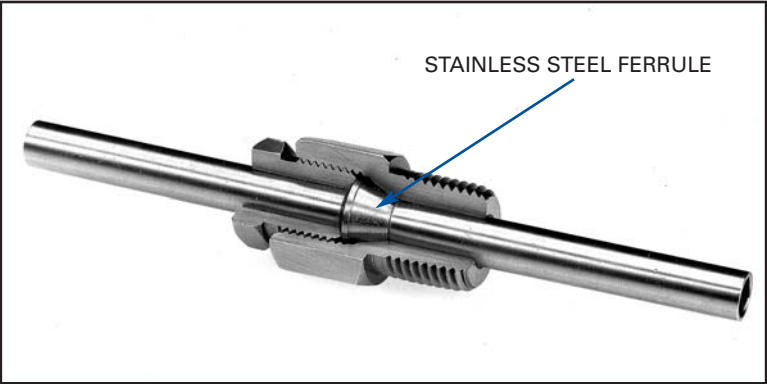
Note 3:
All pressure and vacuum ratings are determined at 20°C with a stainless steel rod as the element.

Note 4:
PG5 glands are available with a 3/4" NPT or a 1" NPT mounting thread. The gland description PG5- etc. indicates that a 3/4" NPT mounting is required; the description PG5(1"NPT)- etc. indicates that a 1" NPT mounting thread is required.

Note 5:
Where no value is shown in the tables the option is not available.

Note 6:
Pressure ratings on large bore models may be influenced by numerous factors and are therefore application specific. Please consult Conax® Buffalo Technologies for details.

Note 7:
PG7, PG8, PG9 gland assemblies have a flange-design cap with qty. 6 x hex. head cap screws.



Conax Buffalo Technologies Model MK Midlock Glands seal a single tube or probe. Featuring a metal-to-metal seal rather than our standard soft sealant technology, MK glands are used where a joint must be opened and resealed in the same setting. Their unique design forms the seal well within the body housing to provide superior performance in high vibration applications.

The MK gland uses compression to deform a stainless steel ferrule against the tube/probe without cutting the sheath surface. A slight deformation of the tube/probe surface may occur, however. MK glands are freely adjustable until first tightened. After that, they may be opened and resealed at that fixed immersion depth.

The rugged reusable body and ferrule are constructed from 303SST standard. The single ferrule is self-aligning to prevent lost pieces. Standard assemblies use Cap Style A with a mounting thread only. Please consult a Conax Buffalo Technologies sales engineer for custom needs.

- Temperature Range: Cryogenic to +870° C
- Pressure Range: Vacuum to 690 bar – all models

Applications for MK glands include:
Pressure or vacuum sealing of thermocouple and RTD probes, tube shielded thermistor probes, laboratory test lines, etc. Use where joint must be opened and resealed in same setting.

- METAL TO METAL SEAL
- SEALS 1 ELEMENT
- FOR GAS OR LIQUID
- STAINLESS STEEL THROUGHOUT (303 SST)
- EASY TO USE—SLIDE ASSEMBLED FITTING OVER TUBE OR PROBE AND SIMPLY TIGHTEN AT DESIRED LOCATION
- SINGLE FERRULE IS SELF-ALIGNING (NO LOST PIECES)
- MAY BE OPENED AND RESEALED
- TEMPERATURE RANGE FROM CRYOGENIC TO +870°C
- PRESSURE*: VACUUM TO 690 BAR
- SUITABLE FOR HIGH VIBRATION APPLICATIONS

REUSABLE CAPABILITY:
All metal MIDLOCK fittings may be opened and resealed at fixed immersion depth.

- Freely adjustable until first tightened.
- Stainless Steel.
- High pressure range 690 bar.
- Single Stainless Steel ferrule is deformed against tube and makes a seal without cutting sheath surface.

SEALANT SELECTION GUIDE

Sealant Material	Temperature range	Pressure range @ 20°C
Stainless Steel (SST)	Cryogenic to +870°C	Vacuum to 690 bar

ACCESSORIES

The replaceable ferrule permits repeated use of the same fitting. The ferrule may be replaced in the field.

Glands are supplied factory lubricated. If glands are cleaned prior to assembly or when reused, the glands should be relubricated to maintain the published torque and pressure ratings. See page 35 for information on our lubrication kit.

SPECIFICATIONS, ORDERING INFORMATION

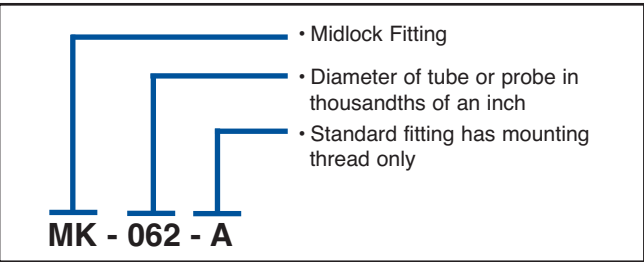
Catalog Number	Probe or Tube Diameter***	Thread NPT	Length (mm)	Hex Size	TORQUE** (Nm)
MK-062-A	.062	1/8"	30.15	1/2"	14
MK-125-A	.125	1/8"	30.15	1/2"	17
MK-187-A	.187	1/8"	30.15	1/2"	24
MK-250-A	.250	1/4"	41.28	5/8"	41
MK-375-A	.375	1/2"	50.80	1"	68

PRESSURE RATING GUIDE

Catalog Number	Pressure Rating** (bar)
MK-062-A	690
MK-125-A	690
MK-187-A	690
MK-250-A	690
MK-375-A	690

CATALOG NUMBERING SYSTEM

To order a Replacement Ferrule, order Ferrule, MK – (Diameter)



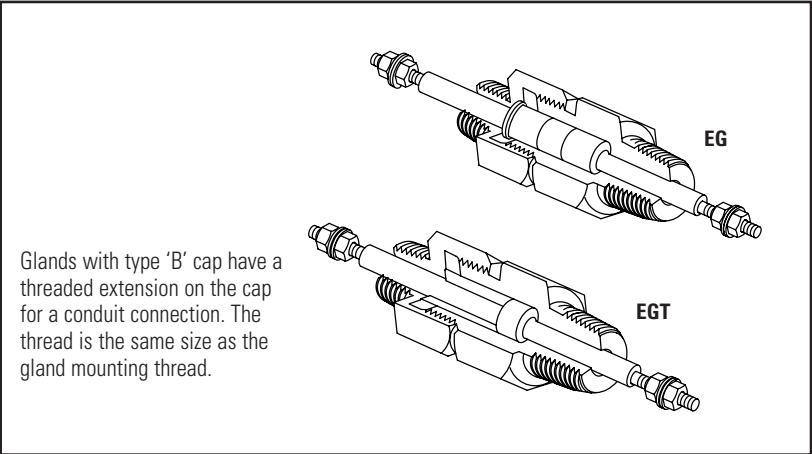
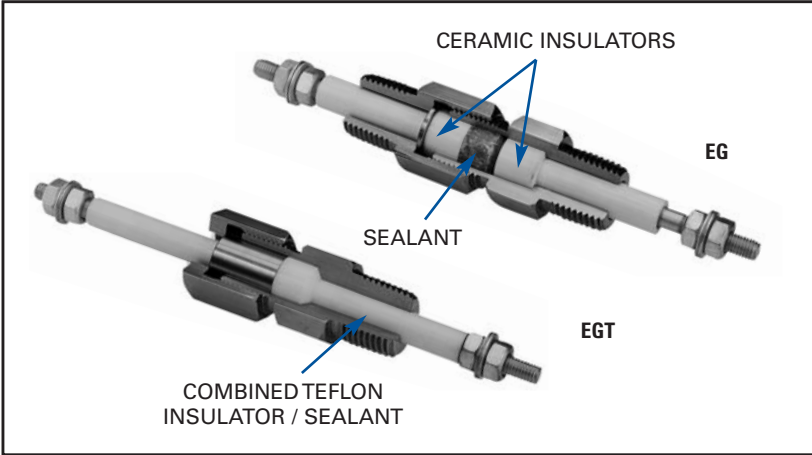
NOTES

Note 1:
*All pressure and vacuum ratings determined at 20°C.

Note 2:
Pressure rating guide values are for glands with elements restrained by the compressed ferrule.

Note 3:
**All pressure and torque ratings determined at 20°C with solid stainless steel rod used as the element.

Note 4:
***Tolerance of tube or probe diameter, ±0.127mm (0.005"). Deviation from the nominal may effect pressure ratings.



Glands with type 'B' cap have a threaded extension on the cap for a conduit connection. The thread is the same size as the gland mounting thread.

EG and EGT glands are pressure / vacuum sealing assemblies with single integral electrodes. These glands are used to provide electrical feedthroughs for high-power and high-voltage supply connections in a range of electrode sizes. Standard glands are supplied with copper, nickel or stainless steel electrodes pre-installed in the gland that is torqued ready for installation. EG & EGT glands can also be supplied untorqued and without electrodes.

EG glands employ soft sealants and have ceramic insulators, they are rated 2,000 Vdc @ 400A max.

EGT glands have a Teflon, single-piece, combined sealant and insulator and are rated 8,000Vdc @ 525A max..

Applications for EG and EGT glands include:
Power feedthroughs for vacuum furnaces, autoclaves, equipment enclosures, transformers and environmental chambers, also high-voltage feedthroughs to reactor vessels.

EG & EGT gland bodies, followers and caps are manufactured from Stainless Steel AISI grades 316L (W.-Nr. 1.4404) and 303 (1.4305). Other materials may be specified see page 42. EG insulators are Alumina.

• **SEALS A SINGLE ELECTRODE OR EQUIVALENT DIAMETER TUBE OR PROBE**

• **FOR APPLICATIONS IN GAS OR NON-CONDUCTIVE LIQUIDS**

• **PRESSURE:**
Vacuum to 550 bar

• **TEMPERATURE:**
-185°C to +870°C

• **VOLTAGE: To 8,000 Vdc**

• **CURRENT: To 525A**

• **STAINLESS STEEL REUSABLE FITTING**

• **REPLACEABLE 'SOFT' SEALANT (EG) OR COMBINED,TEFLON INSULATOR/SEALANT (EGT)**

Conax Buffalo Technologies sealing assemblies can be specified for use in a range of temperature, pressure and environmental situations. A sealant may be chosen for EG glands that is suitable for the application. EGT glands are only available with a single-piece, Teflon insulator/sealant. Replacement sealants, insulators and electrodes are available to enable repeated use of fittings.

Installation information and torque settings for glands supplied untorqued or without electrodes are shown in the Assembly Instructions, see pages 36 to 41.

SEALANT SELECTION GUIDE

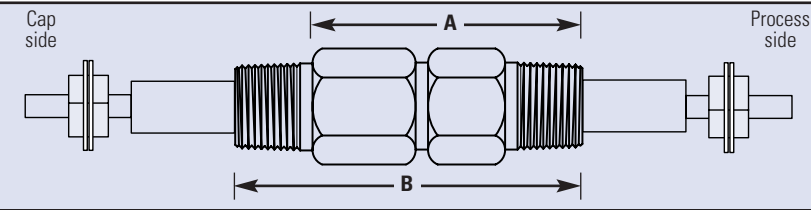
Sealant (Sealant Code)	Temperature range	Pressure range @ 20°C
Neoprene (N) [EG]	-40°C to +93°C	Vacuum to 355 bar
Viton (V) [EG]	-20°C to +232°C	Vacuum to 220 bar
Teflon (T) [EG & EGT]	-185°C to + 232°C	Vacuum to 345 bar [EG] 170 bar [EGT]
Lava (L) [EG]	-185°C to + 870°C	1 bar to 550 bar

SPECIFICATIONS, ORDERING INFORMATION

Current Rating (A) <i>Electrode</i> <i>(See note 2)</i>			Gland mounting thread (NPT)	Gland Description [Order Code] <i>(See note 1)</i>	Pressure rating by sealant (bar) <i>(See note 3)</i>			
<i>CU</i>	<i>Ni</i>	<i>SS</i>			Neoprene (N)	Viton (V)	Teflon (T)	Lava (L)
EG glands (Rating operating voltage 2kV max.)								
20	10	3	⅛"	EG - 093 - * - ¶ - **	220	220	220	275
40	15	6	¼"	EG - 125 - * - ¶ - **	355	220	345	550
60	25	9	¼"	EG - 187 - * - ¶ - **	170	220	170	330
95	40	15	½"	EG - 250 - * - ¶ - **	80	80	135	380
125	50	20	½"	EG - 312 - * - ¶ - **	110	80	220	380
160	65	24	¾"	EG - 375 - * - ¶ - **	40	55	170	275
200	80	30	¾"	EG - 500 - * - ¶ - **	40	40	110	105
400	165	60	1½"	EG - 750 - * - ¶ - **	-	-	125	-
EGT glands (Rating operating voltage 8kV max. except EGT-093 4kV max.)								
20	10	3	⅛"	EGT - 093 - * - ¶	-	-	170	-
40	15	6	¼"	EGT - 125 - * - ¶	-	-	80	-
60	25	9	½"	EGT - 187 - * - ¶	-	-	110	-
95	40	15	½"	EGT - 250 - * - ¶	-	-	80	-
160	65	24	¾"	EGT - 375 - * - ¶	-	-	40	-
200	80	30	¾"	EGT - 500 - * - ¶	-	-	40	-
400	165	60	1"	EGT - 750 - * - ¶	-	-	40	-
525	240	72	1¼"	EGT - 1000 - * - ¶	-	-	7	-

DIMENSIONS

Size of gland	Gland mounting thread (NPT)	Electrode (Conductor) Dia. (mm)	Length (mm)	Body Hex size (in.)	Cap Hex size (in.)	Length of gland with type A cap Dim. A (mm)	Length of gland with type B cap Dim. B (mm)
EG-093	1/8"	2.36	89	1/2	9/16	34.93	44.45
EGT-093	1/8"		81		1/2	30.16	39.69
EG & EGT-125	1/4"	3.05	127	3/4	3/4	52.39	66.68
EG-187		4.62					
EGT-187							
EG & EGT-250	1/2"	6.22	165	1	1	65.09	87.31
EG-312		7.80					
EG-375		9.40				79.38	98.43
EGT-375	3/4"		216	1 1/4	1 1/2	73.03	92.08
EG-500		12.57				79.38	98.43
EGT-500						73.03	92.08
EG-750	1 1/2"	18.92	394	3" dia	3 1/2" dia	139.70	-
EGT-750	1"	18.92	235	1 3/4	2	88.90	114.30
EGT-1000	1 1/4"	25.27	254	3" dia	3" dia	95.25	-



NOTES

Note 1:
The Gland Description [Order Code] shown in the table, is completed by selecting the type of cap required - A or B is inserted at *.
The code for the electrode required is inserted as follows:
CU for Copper (Max. temp. 380°C).
NI for Nickel (Max. temp. 600°C).
SS for Stainless Steel (Max. temp. 870°C)
XX without an electrode
For EG glands the code letter for the sealant selected is inserted at **.
(See opposite for sealant information).

EG example: EG-125-B-NI-L
describes an EG-125 size gland (1/4" NPT mounting thread) with a nickel electrode rated 15A max., with type B cap and Lava sealant.

EGT example: EGT-250-A-CU
describes an EGT-250 size gland (1/2" NPT mounting thread) with a copper electrode rated 95A max., and type A cap.

Replacement Sealant Order Code
Examples: RS-EG-125-L
RS-EGT-250

Replacement Packing Set Order Code for EG glands (Sealant and two ceramic insulators)
Example: RPS-EG-125-L

Replacement Insulator Order Code for EG glands (Single insulator)
Example: RI-EG-125

Replacement Electrode Order Code
Examples: RE-EG-125-NI
RE-EGT-250-CU

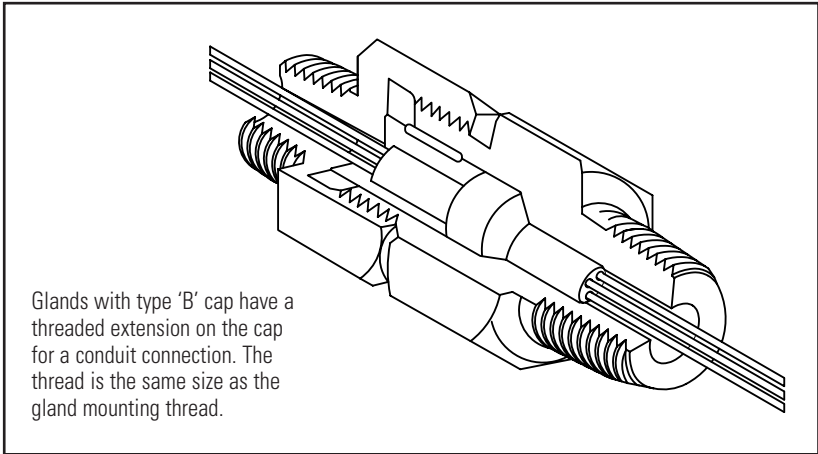
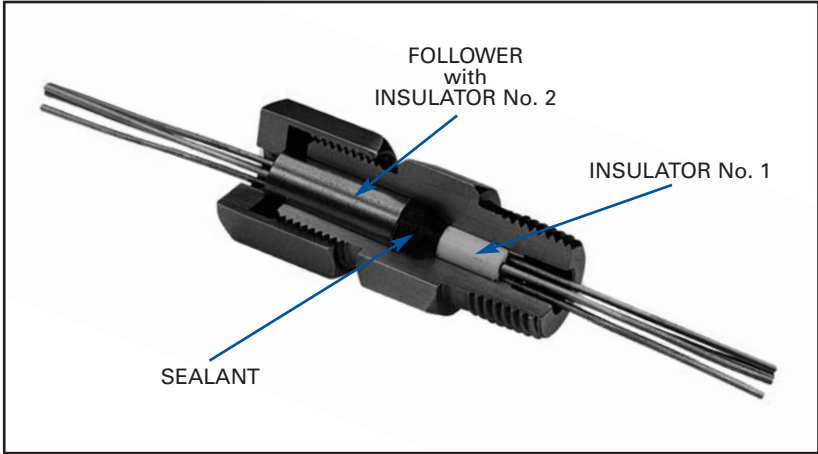
Note 2:
Electrodes have tapped threads and are fitted with two nuts and washers at each end for ring tongue or lug-type cable terminals.

Electrodes may be substituted with tubes, probes or sensors of equivalent diameter ±0.127mm (0.005") *Caution: May affect pressure ratings.*

Note 3:
All pressure and vacuum ratings are determined at 20°C with a stainless steel rod as the element. For vacuum ratings see page 42.

Note 4:
Where no value is shown in the tables the option is not available.

Note 5:
EG-750 & EGT-1000 gland assemblies have a flange-design cap with qty. 6 x hex. head cap screws.
Type B cap not available. An EG-750 gland and an EGT-1000 body style is same as PG-7 on page 10.



MHC glands allow for pressure and vacuum sealing of up to 16 tubes or probes through a single fitting. Glands are available to carry elements in both metric and inch sizes from 0.5mm (0.020") to 3.2mm (0.125") dia.

Applications for MHC glands include:
Pressure and vacuum sealing of multiple thermocouples, resistance thermometers, thermistor probes, tube bundles, liquid level sensors, or a variety of other sensors and devices.

MHC gland bodies, followers and caps are manufactured from Stainless Steel AISI grades 316L (W.-Nr. 1.4404) and 303 (1.4305). Other materials may be specified see page 42. MHC insulators are Alumina.

Installation information and torque settings for glands are shown in the Assembly Instructions, see pages 36 to 41.

- SEALS 1 TO 16 ELEMENTS
- ADJUSTABLE IMMERSION LENGTH FOR EACH TUBE, PROBE OR SENSOR
- PRESSURE:
Vacuum to 690 bar
- TEMPERATURE:
-240°C TO +870°C
- FIELD ADJUSTABLE
- REPLACEABLE 'SOFT' SEALANT
- STAINLESS STEEL REUSABLE FITTING
- SELECTED ELEMENTS EASILY REPLACED IN THE FIELD
- EASY INSTALLATION

Conax pressure and vacuum sealing assemblies can be specified for use in a range of temperature, pressure and environmental situations by choosing a sealant that is suitable for the application. Replacement sealants and replacement packing sets (sealant with two insulators) are available to enable repeated use of fittings.

SEALANT SELECTION GUIDE

Sealant (Sealant Code)	Temperature range	Pressure range @ 20°C
Neoprene (N)	-40°C to +93°C	Vacuum to 690 bar
Viton (V)	-20°C to +232°C	Vacuum to 690 bar
Teflon (T)	-185°C to +232°C	Vacuum to 690 bar
Lava (L)	-185°C to + 870°C	1bar to 690 bar
Grafoil (G)	-240°C to +495°C (to +1650°C in a reducing atmos.)	Vacuum to 690 bar

SPECIFICATIONS, ORDERING INFORMATION

Diameter of element to be sealed (See note 2) mm	Number of elements	Gland mounting thread (NPT)	Gland Description (Order Code) (See note 1)	Pressure rating by sealant (bar) (See note 3)				
				Neoprene (N)	Viton (V)	Teflon (T)	Lava (L)	Grafoil (G)
0.5 0.020	2	1/8"	MHC1 - 020 - *2 - **	690	690	690	690	690
	2	1/8"	MHC2 - 020 - *2 - **	690	690	690	690	690
	4	1/8"	MHC1 - 020 - *4 - **	690	690	690	690	690
	4	1/8"	MHC2 - 020 - *4 - **	690	690	690	690	690
1.0 0.040	2 or 4	1/4"	MHC2 - 040 - * - **	690	690	690	690	690
	6 or 8	1/2"	MHC4 - 040 - * - **	690	690	690	690	690
0.032	2	1/8"	MHC1 - 032 - *2 - **	690	690	550	690	690
	2	1/8"	MHC2 - 032 - *2 - **	690	690	690	690	690
	4	1/8"	MHC1 - 032 - *4 - **	690	690	550	690	690
	4	1/8"	MHC2 - 032 - *4 - **	690	690	690	690	690
	6 or 8	1/2"	MHC4 - 032 - * - **	690	690	690	690	690
	16	3/4"	MHC5 - 032 - *16 - **	550	550	550	690	690
1.5 0.062	1	1/8"	MHC1 - 062 - *1 - **	550	550	550	550	690
	1	1/4"	MHC2 - 062 - *1 - **	690	690	690	690	690
	2, 3 or 4	1/2"	MHC4 - 062 - * - **	550	690	550	690	690
	6	3/4"	MHC5 - 062 - *6 - **	550	690	550	690	690
	8	3/4"	MHC5 - 062 - *8 - **	550	690	690	690	690
3.0 0.125	2	3/4"	MHC5 - 118 - *2 - **	205	275	415	690	690
	2	3/4"	MHC5 - 125 - *2 - **	205	275	415	690	690

NOTES

Note 1:
The Gland Description [Order Code] shown in the table, is completed by selecting the type of cap required - A or B is inserted at * followed by the number of elements to be sealed. (Where there is no choice for the number of elements the number is already shown). The code letter for the sealant selected is inserted at ** (See opposite page for sealant information).

Example: MHC4-040-B6-T describes an MHC4 size gland (1/2", NPT mounting thread) suitable for quantity 6 x 1.0mm (0.040") dia. elements, with type B cap and Teflon sealant.

Replacement Sealant Order Code
Example: RS-MHC4-040-6-T

Replacement Packing Set Order Code
Example: RPS-MHC4-040-6-T

Note 2:
Tolerance of tube or probe diameter = ±0.076mm (0.003") for elements <1.0mm (0.040") and ±0.127mm (0.005") for elements >1.0mm. Deviation from the nominal may affect pressure ratings.

Note 3:
All pressure and vacuum ratings are determined at 20°C with a stainless steel rod as the element. For vacuum ratings see page 42.

DIMENSIONS

Size of gland	Gland mounting thread (NPT)	Body Hex size (in.)	Cap Hex size (in.)	Length of gland with type A cap Dim. A (mm)	Length of gland with type B cap Dim. B (mm)
MHC1	1/8"	9/16	1/2	34.93	44.45
MHC2	1/4"	3/4	3/4	50.80	66.68
MHC4	1/2"	1	1	66.68	85.73
MHC5	3/4"	1 1/4	1 1/4	73.03	92.08

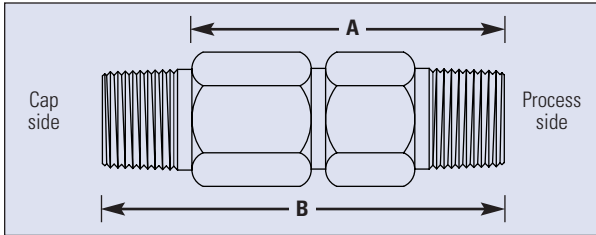
GLANDS WITH THREAD SIZE REDUCTION

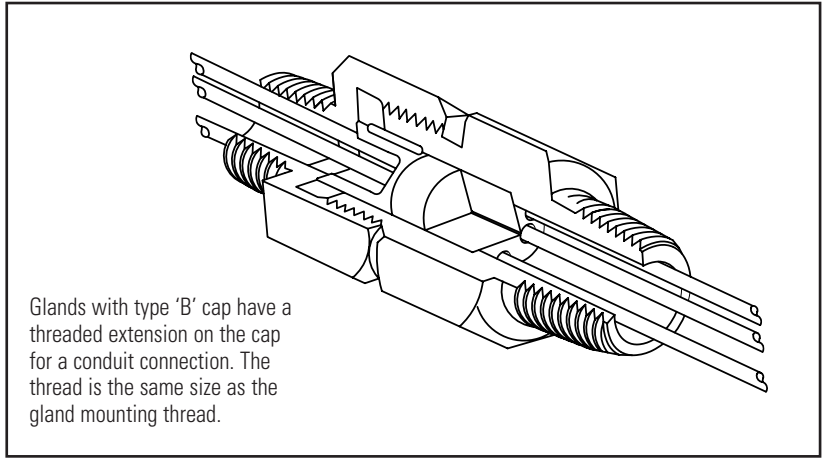
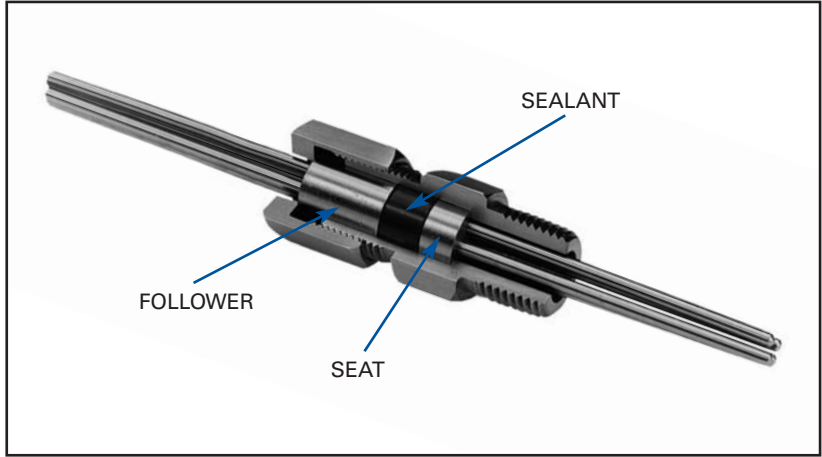
MHC, PL* and TG glands are optionally available with reduced size mounting threads and conduit threads on 'B' type caps.

Sizes (Standard size reduced to smaller size) 1/4 to 1/8 NPT
1/2 to 1/4 NPT
3/4 to 1/2 NPT*

*Not available for PL-18-10 & -12, PL-16-10 & -12, PL-14-10 & -12, PL-8-3.

Order Code: Add thread size required after Gland Description
Example: MHC4-040-A6-T, 1/4 NPT





Glands with type 'B' cap have a threaded extension on the cap for a conduit connection. The thread is the same size as the gland mounting thread.

MHM glands allow for pressure and vacuum sealing of tubes or probes through a single fitting. They are intended for use when other types of gland are not suitable or not available in a particular configuration. MHM glands may also be specified when a mixture of element sizes need to pass through a single fitting, when special hole patterns or irregular shapes are required and when a higher density of elements, than possible in other types of glands, is needed. Glands are available to carry elements in both metric and inch sizes from 1.0mm (0.040") to 9.53mm (0.375") dia.

Applications for MHM glands include: Pressure and vacuum sealing of gradient thermocouples, thermistor probes, tube bundles, liquid level sensors, or a variety of other sensors and devices in a single fitting.

MHM gland bodies, followers, caps and seats are manufactured from Stainless Steel AISI grades 316L (W.-Nr. 1.4404) and 303 (1.4305). Other materials may be specified see page 42.

Installation information and torque settings for glands are shown in the Assembly Instructions, see pages 36 to 41.

Conax pressure and vacuum sealing assemblies can be specified for use in a range of temperature, pressure and environmental situations by choosing a sealant that is suitable for the application. Replacement sealants and replacement packing sets (sealant with follower and seat) are available to enable repeated use of fittings.

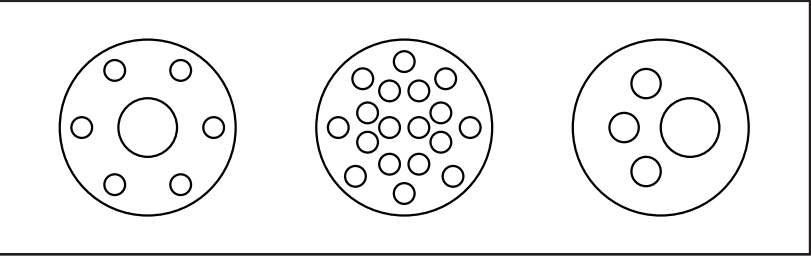
SEALANT SELECTION GUIDE

Sealant (Sealant Code)	Temperature range	Pressure range @ 20°C
Neoprene (N)	-40°C to +93°C	Vacuum to 550 bar
Viton (V)	-20°C to +232°C	Vacuum to 690 bar
Teflon (T)	-185°C to +232°C	Vacuum to 550 bar
Lava (L)	-185°C to + 870°C	1bar to 690 bar
Grafoil (G)	-240°C to +495°C (to +1650°C in a reducing atmos.)	Vacuum to 690 bar

- **SEALS 1 TO 27 ELEMENTS (STANDARD)**
- **ADJUSTABLE IMMERSION LENGTH FOR EACH TUBE, PROBE OR SENSOR**
- **PRESSURE:**
Vacuum to 690 bar
- **TEMPERATURE:**
-240°C to +870°C
- **FIELD ADJUSTABLE**
- **REPLACEABLE 'SOFT' SEALANT**
- **STAINLESS STEEL REUSABLE FITTING**
- **SELECTED ELEMENTS EASILY REPLACED IN THE FIELD**
- **EASY INSTALLATION**

SPECIFICATIONS, ORDERING INFORMATION

Diameter of element to be sealed (See note 2)	mm	Maximum Number of elements	Gland mounting thread (NPT)	Gland Description [Order Code] (See note 1)	Pressure rating by sealant (bar) (See note 3)				
					Neoprene (N)	Viton (V)	Teflon (T)	Lava (L)	Grafoil (G)
1.0	0.040	5	1/4"	MHM2 - 040 - * - **	-	690	220	690	550
		10	3/4"	MHM5 - 040 - * - **	360	470	310	135	275
		12	3/4"	MHM5 - 040 - * - **	360	470	310	170	310
		16	3/4"	MHM5 - 040 - * - **	360	470	310	205	310
1.5		5	1/4"	MHM2 - 059 - * - **	275	690	165	690	440
		16	3/4"	MHM5 - 059 - * - **	220	495	410	480	445
	0.062	5	1/4"	MHM2 - 062 - * - **	275	690	165	690	440
		16	3/4"	MHM5 - 062 - * - **	220	495	410	480	445
3.0		4	1/2"	MHM4 - 118 - * - **	550	345	550	690	690
		8	3/4"	MHM5 - 118 - * - **	275	310	310	410	310
	0.125	4	1/2"	MHM4 - 125 - * - **	550	345	550	690	690
		8	3/4"	MHM5 - 125 - * - **	275	310	310	410	310
	0.187	6	3/4"	MHM5 - 187 - * - **	80	470	110	580	550
6.0		4	3/4"	MHM5 - 236 - * - **	295	345	110	460	310
		4	3/4"	MHM5 - 250 - * - **	295	345	110	460	310
	0.250								
3.0		10	1"	MHM6 - 118 - * - **	-	690	103	-	165
		27	1"	MHM6 - 118 - * - **	-	690	103	-	165
6.0		5	1"	MHM6 - 236 - * - **	-	414	69	-	69
		7	1"	MHM6 - 236 - * - **	-	414	69	-	69
	0.375	2	1"	MHM6 - 375 - * - **	-	207	69	-	69
		4	1"	MHM6 - 375 - * - **	-	207	69	-	69



Custom hole patterns can be provided for specific applications. Pressure ratings of glands using similar patterns will be dependent on the number and size of elements as well as the sealant material chosen.

DIMENSIONS

Size of gland	Gland mounting thread (NPT)	Body Hex size (in.)	Cap Hex size (in.)	Length of gland with type A cap Dim. A (mm)	Length of gland with type B cap Dim. B (mm)
MHM2	1/4"	3/4	3/4	50.80	66.68
MHM4	1/2"	1	1	65.09	85.73
MHM5	3/4"	1 1/2	1 1/2	84.14	106.36
MHM6	1"	Round Body and Cap 69.85mm dia.		95.25	127.00

NOTES

The table is primarily for guidance when specifying MHM glands. Each size of gland listed shows the maximum number of each size of elements that can be accommodated at the pressure ratings indicated. The table only refers to glands which will carry a single element or multiple elements of the same diameter

Note 1: Where MHM glands are to be specified when all elements to pass through the gland are of the same diameter, the Gland Description [Order Code] shown in the table, is completed by selecting the type of cap required - A or B is inserted at * followed by the number of elements to be sealed. The code letter for the sealant selected is inserted at **. (See opposite page for sealant information).

Example: MHM4-118-A4-L describes an MHM4 size gland (1/2" NPT mounting thread) suitable for quantity 4 x 3.0mm dia. elements, with type A cap and Lava sealant.

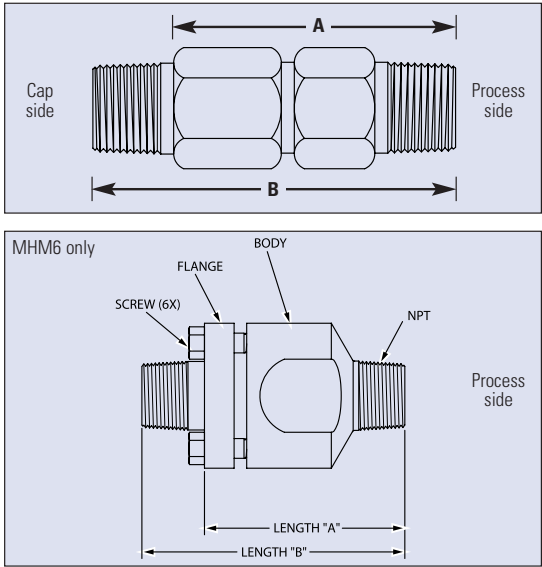
Replacement Sealant Order Code Example: RS-MHM4-118-4-L

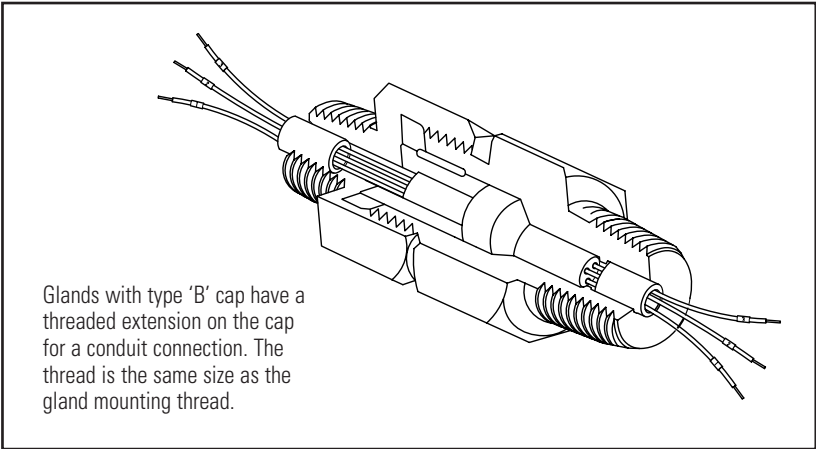
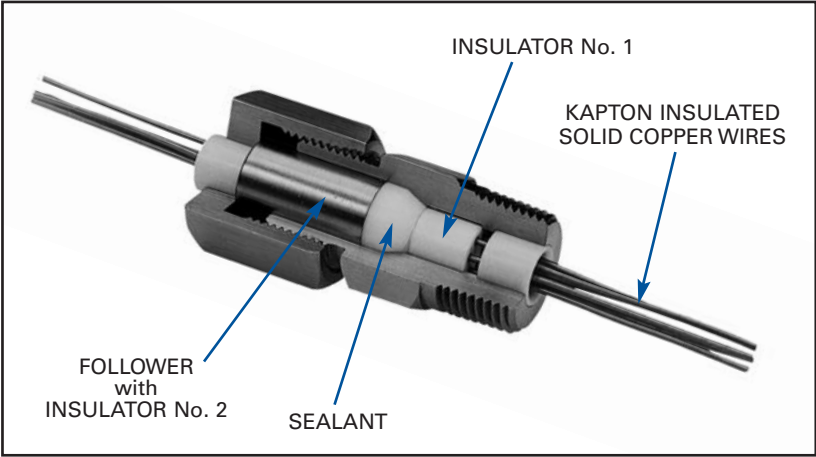
Replacement Packing Set Order Code Example: RPS-MHM4-118-4-L

Note 2: Tolerance of tube or probe diameter = ±0.127mm (0.005"). Deviation from the nominal may affect pressure ratings.

Note 3: All pressure and vacuum ratings are determined at 20°C with a stainless steel rod as the element. For vacuum ratings see page 42.

Note 4: MHM6 gland assemblies have a flange-design cap with qty. 6 x hex. head cap screws.





PL glands carry from 1 up to 18 wires in 8 AWG to 20 AWG wire sizes. Standard glands are supplied with Kapton insulated copper or thermocouple material wires pre-installed in the gland that is torqued ready for installation. PL glands can also be supplied untorqued and without wires.

Applications for PL glands include:
Safety seals for transformers and motor power supplies, conduit and junction box feedthroughs, power and instrumentation feedthroughs in pressure vessels and vacuum chambers, autoclaves and ovens.

PL gland bodies, followers and caps are manufactured from Stainless Steel AISI grades 316L (W.-Nr. 1.4404) and 303 (1.4305). Other materials may be specified see page 42. PL insulators are Alumina. Body and cap sleeves are Teflon.

Installation information and torque settings for glands supplied untorqued or without wires are shown in the Assembly Instructions, see pages 36 to 41.

- **SEALS 1 TO 18 WIRES
SIZES 8 TO 20 AWG**
- **AVAILABLE WITH OR WITHOUT
KAPTON-INSULATED COPPER
OR THERMOCOUPLE MATERIAL
CONDUCTORS**
- **PRESSURE:
Vacuum to 690 bar**
- **TEMPERATURE
-240°C to +232°C**
- **RATED 600Vac / 850VDC
@ 55A MAX.**
- **EASILY ASSEMBLED IN THE
FIELD, WIRES CAN BE
INDIVIDUALLY REPLACED**
- **WIRE IDENTIFICATION
MARKERS APPLIED**
- **EASY INSTALLATION-
NO POTTING**

Conax pressure and vacuum sealing assemblies can be specified for use in a range of temperature, pressure and environmental situations by choosing a sealant that is suitable for the application. Replacement sealants and replacement packing sets (sealant and insulators) are available to enable repeated use of fittings.

SEALANT SELECTION GUIDE

Sealant (Sealant Code)	Temperature range	Pressure range @ 20°C
Teflon (T)	-185°C to +232°C	Vacuum to 345 bar
Grafoil (G)	-240°C to + 232°C	Vacuum to 690 bar

Kapton is a polyimide film with an FEP binder that is hermetically wrapped on wires with a 50% overlap. It is abrasion resistant and has excellent dielectric and insulation properties. It does not readily absorb moisture but should not be used in environments where pH>12.

SPECIFICATIONS, ORDERING INFORMATION

Wire Size (AWG) (See Note 2)	Number of wires	Current rating per wire (A)	Gland mounting thread (NPT)	Gland Description (Order Code) (See note 1)	Pressure rating by sealant (bar) (See note 3)	
					Teflon (T)	Grafoil (G)
20	2, 3 or 4	9	1/2"	PL - 20 - * - * - *	345	690
	6 or 8		3/4"	PL - 20 - * - * - *	220	690
	18		3/4"	PL - 20 - * - * - *	165	690
18	1	13	1/8"	PL - 18 - *1 - * - *	110	690
	2, 3 or 4		1/2"	PL - 18 - * - * - *	275	690
	6 or 8		3/4"	PL - 18 - * - * - *	185	690
	10 or 12		3/4"	PL - 18 - * - * - *	145	690
16	2, 3 or 4	17	1/2"	PL - 16 - * - * - *	205	690
	6 or 8		3/4"	PL - 16 - * - * - *	185	690
	10 or 12		3/4"	PL - 16 - * - * - *	115	690
14	1	24	1/8"	PL - 14 - *1 - * - *	55	690
	2		1/2"	PL - 14 - *2 - * - *	100	690
	3			PL - 14 - *3 - * - *	135	690
	4			PL - 14 - *4 - * - *	110	690
	6 or 8		3/4"	PL - 14 - * - * - *	110	690
	10 or 12			PL - 14 - * - * - *	95	690
12	2, 3, 4 or 6	30	3/4"	PL - 12 - * - * - *	80	600
10	2, 3 or 4	40	3/4"	PL - 10 - * - * - *	80	550
8	2	55	3/4"	PL - 8 - *2 - * - *	55	550
	3			PL - 8 - *3 - * - *	55	550

NOTES

Note 1:
The Gland Description [Order Code] shown in the table, is completed by selecting the type of cap required - A or B is inserted at* followed by the number of wires required. The code letter for the sealant selected is inserted at ** (See opposite page for sealant information). The length of wire required is inserted at ¶ in the following way: xz/yz, where
x = wire length on cap side of gland,
y = wire length on process side,
z = units of measurement (m. - metres to the nearest 0.1 m., or, in. - inches)
Minimum wire length: 600mm (0.6m) total.
Bulk wire in selected sizes is available.

Example: PL-18-A4-G-1m/2m
describes a PL-18 size gland with 4 x 18AWG copper wires (1/2" NPT mounting thread), with type A cap and Grafoil sealant. 1 metre of wire is required on the cap side of the gland and 2 metres of wire on the process side.

When thermocouple material wires are required, the type of T/C wire (18AWG size, types E, J, K & T available) is added after the wire size in the order code.
Example: PL-18(J)-A4-G-1m/2m
describes a PL-18 size gland with 2 x J-type thermocouple pairs.

When no wires are required the wire length information is omitted and XX is placed after the sealant code.
Example: PL-18-A4-G-XX

Replacement Sealant Order Code
Example: RS-PL-18-4-G

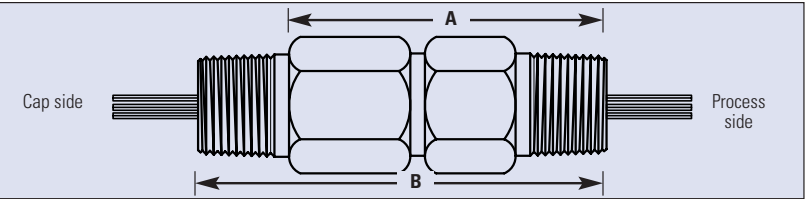
Replacement Packing Set Order Code Example:
RPS-PL-18-4-G

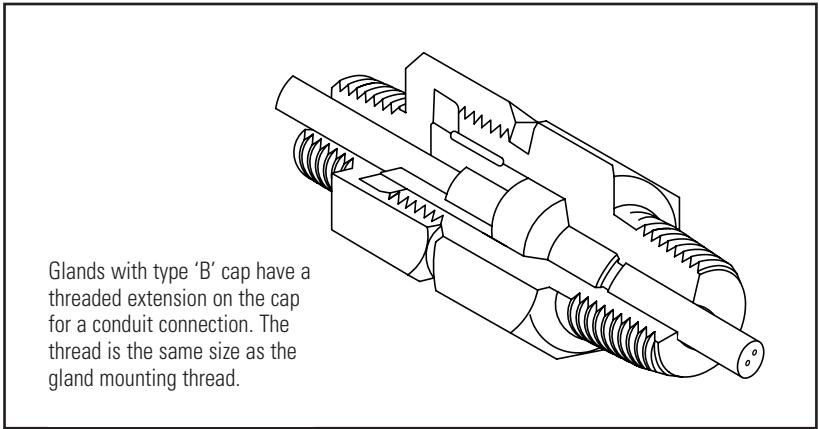
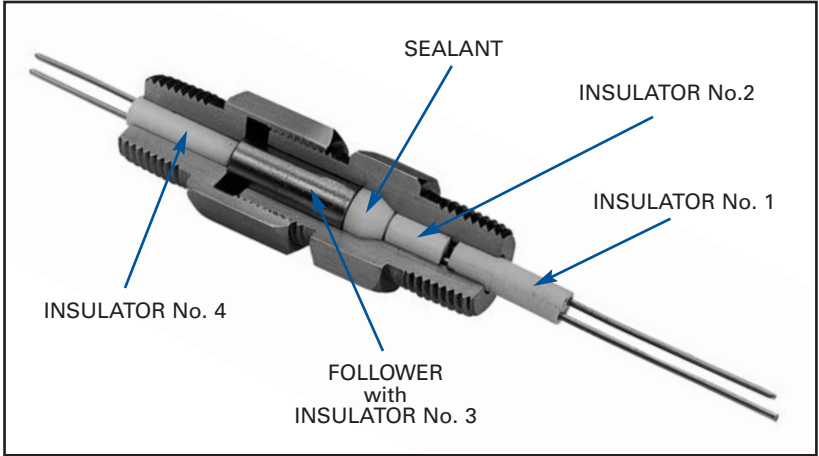
Note 2:
Customer-supplied insulated wire or other elements of equivalent O.D. may be used when PL glands are supplied without wire. Refer to the table of wire sizes on page 41. An allowance of 0.48mm dia. should be made for the thickness of the Kapton insulation. Glands with Kapton insulated wire can be supplied with solderless (crimped) terminals fitted to wire ends - at additional cost.

Note 3:
All pressure and vacuum ratings are determined at 20°C with Kapton insulated copper wire as the element. For vacuum ratings see page 42.

DIMENSIONS

Size of gland	Gland mounting thread (NPT)	Body Hex size (in.)	Cap Hex size (in.)	Length of gland with type A cap Dim. A (mm)	Length of gland with type B cap Dim. B (mm)
PL-18-*1 PL-14-*1	1/8"	1/2	3/8	37.30	46.83
PL-20-*2, 3 & 4 PL-18-*2, 3 & 4 PL-16-*2, 3 & 4 PL-14-*2	1/2"	1	1	66.68	85.73
PL-14-*3 & 4	1/2"	1 1/8	1 1/4	73.03	92.08
PL-20-*6 & 8 PL-18-*6 & 8 PL-14-*6 & 8 PL-12 PL-10 PL-8-*2	3/4"				
PL-20-18 PL-18-*10 & 12 PL-16-*10 & 12 PL-14-*10 & 12 PL-8-*3	3/4"	1 1/4	1 1/2		





TG glands are designed for sealing up to 16 bare, solid wire conductors (not stranded). Glands can accommodate wire sizes 8 to 24 AWG. Max. voltage rating 50mV.

The same glands can also be specified as complete assemblies type TG-24T, ready for installation, with 24 AWG size Teflon insulated copper or thermocouple material wires. A Teflon sealant is used in these assemblies.

Applications for TG glands include:
Pressure and vacuum sealing of solid bare wire transducers such as thermocouples, strain-gauges, thermistors, resistance element leads and low voltage, low current supplies and signal wires to instrumentation. Applications for TG-24T gland assemblies with insulated wire include sealing of wires exiting compressor bearing housings, pressure vessels and instruments.

TG gland bodies, followers and caps are manufactured from Stainless Steel AISI grades 316L (W.-Nr. 1.4404) and 303 (1.4305). TG insulators are Alumina.

Installation information and torque settings for glands are shown in the Assembly Instructions, see pages 36 to 41.

Conax pressure and vacuum sealing assemblies can be specified for use in a range of temperature, pressure and environmental situations by choosing a sealant that is suitable for the application. Replacement sealants and replacement packing sets (sealant and four insulators) are available to enable repeated use of fittings.

SEALANT SELECTION GUIDE

Sealant (Sealant Code)	Temperature range	Pressure range @ 20°C
Neoprene (N)	-40°C to +93°C	Vacuum to 690 bar
Viton (V)	-20°C to +232°C	Vacuum to 690 bar
Teflon (T)	-185°C to + 232°C	Vacuum to 690 bar [Vacuum to 300 bar - TG-24T assemblies with 24 AWG insulated wire]
Lava (L)	-185°C to + 870°C	1 bar to 690 bar

For assemblies carrying more than 16 wires refer to High Density wire feedthrough assemblies type HD - pages 30 & 31.

- SEALS 1 TO 16 ELEMENTS
- FOR LOW-VOLTAGE & LOW-CURRENT, BARE INSTRUMENTATION WIRES
- FOR INSULATED COPPER OR THERMOCOUPLE-MATERIAL WIRES
- PRESSURE: Vacuum to 690 bar
- TEMPERATURE: -240°C to +870°C
- FOR NON-CONDUCTIVE GAS AND LIQUID
- EASILY ASSEMBLED IN THE FIELD, WIRES CAN BE INDIVIDUALLY REPLACED
- REPLACEABLE 'SOFT' SEALANT
- EASY INSTALLATION - NO POTTING

SPECIFICATIONS, ORDERING INFORMATION

TG GLANDS FOR BARE WIRE SEALING

Wire Gauge (AWG) (See Note 2)	Number of wires	Gland mounting thread (NPT)	Gland Description [Order Code]	Pressure rating by sealant (bar) (See note 3)			
				Neoprene (N)	Viton (V)	Teflon (T)	Lava (L)
24	2	1/4"	MTG-24 - * 2 - * *	690	690	690	690
	2	1/4"	TG-24 - * 2 - * *	690	690	690	690
	4	1/8"	MTG-24 - * 4 - * *	690	690	690	690
	4	1/4"	TG-24 - * 4 - * *	690	690	690	690
20	2	1/4"	MTG-20 - * 2 - * *	690	690	550	690
	2	1/4"	TG-20 - * 2 - * *	690	690	690	690
	4	1/8"	MTG-20 - * 4 - * *	690	690	550	690
	4	1/4"	TG-20 - * 4 - * *	690	690	690	690
	6 or 8	1/2"	TG-20 - * - * *	690	690	690	690
	16	3/4"	TG-20 - * 16 - * *	690	550	550	690
18	6 or 8	1/2"	TG-18 - * - * *	690	690	690	690
14	1	1/8"	MTG-14 - * 1 - * *	550	550	550	550
	1	1/4"	TG-14 - * 1 - * *	690	690	690	690
	2, 3 or 4	1/2"	TG-14 - * - * *	550	690	550	690
	6 or 8	3/4"	TG-14 - * - * *	550	690	690	690
8	2	3/4"	TG-8 - * 2 - * *	205	275	415	690

TG-24T GLAND ASSEMBLIES WITH 24 AWG INSULATED WIRE

Number of wires	Gland mounting thread (NPT)	Gland Description [Order Code] (See note 4)	Pressure rating (bar) (See note 5) Teflon (T)
2	1/8"	MTG-24T(⌘)-*2-T, ¶	220
4		MTG-24T(⌘)-*4-T, ¶	220
2	1/4"	TG-24T(⌘)-*2-T, ¶	300
4		TG-24T(⌘)-*4-T, ¶	300
6	1/2"	TG-24T(⌘)-*6-T, ¶	220
8		TG-24T(⌘)-*8-T, ¶	220
12	3/4"	TG-24T(⌘)-*12-T, ¶	220
16		TG-24T(⌘)-*16-T, ¶	220

Wire Types (⌘)

CU	Copper	E	Chromel / Constantan
J	Iron / Constantan	CX	Tungsten - 5% Rhenium / Tungsten - 26% Rhenium
K	Chromel / Alumel		
T	Copper / Constantan	SX/RX	Copper / Copper Nickel

NOTES

Note 1:
The Gland Description [Order Code] shown in the table, is completed by selecting the type of cap required - A or B is inserted at * followed by the number of elements to be sealed. (Where there is no choice for the number of elements the number is already shown). The code letter for the sealant selected is inserted at **. (See opposite page for sealant information).

Example: TG-20-B2-N describes a TG gland for 2 x 20 AWG elements (1/4" NPT mounting thread), with type B cap and Neoprene sealant.

Replacement Sealant Order Code Example: RS-TG-20-2-N

Replacement Packing Set Order Code Example: RPS-TG-20-2-N

Note 2:
Customer-supplied insulated solid wire of equivalent size may be substituted for bare wire to provide a higher voltage carrying capability. Other elements of equivalent O.D. may also be used. *Caution: Pressure ratings may vary.* Refer to the table of wire sizes on page 41.

Note 3:
All pressure and vacuum ratings are determined at 20°C with a stainless steel rod as the element. For vacuum ratings see page 42.

Note 4:
The Gland Description [Order Code] shown in the tables of TG-24T & TGF assemblies, is completed by selecting the wire type required, (refer to the table of wire types available). The wire type code is inserted at ⌘. The cap type required - A or B is inserted at * The length of wire required is inserted at ¶ in the following way: xz/yz, where x = wire length on cap side of gland, y = wire length on process side, z = units of measurement (m. - metres to the nearest 0.1m., or, in. - inches) Minimum wire length: 1200mm (1.2m) total.

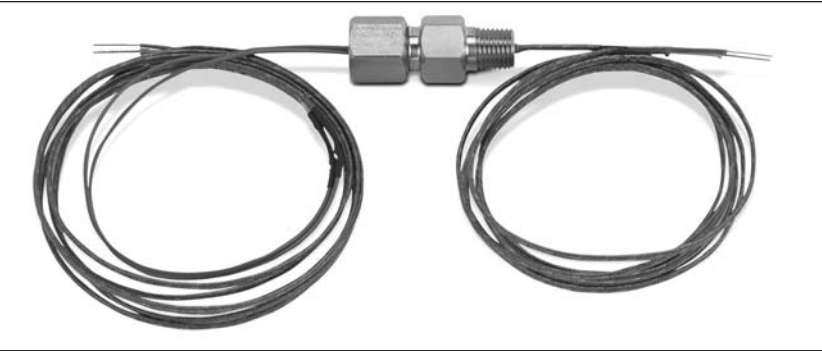
Example: TG-24T(J)-A2-T, 1.0m/2.5m describes an assembly with a single pair of 24 AWG type-J thermocouple material wires. The gland has a 1/4" NPT mounting, a type A cap and a Teflon sealant.

Note 5:
All pressure and vacuum ratings are determined at 20°C with Teflon-insulated wire as the element. For vacuum ratings see page 42.

DIMENSIONS

Size of gland	Gland mounting thread (NPT)	Body Hex size (in.)	Cap Hex size (in.)	Length of gland with Type A cap Dim. A (mm)	Length of gland with Type B cap Dim. B (mm)
MTG, MTG-24F - 2&4 MTG-24T MTG-20F - 2	1/8"	1/2	9/16	34.93	44.45
TG-24-*2 & 4 TG-24F - 2 & 4 TG-24T-*2 & 4 TG-20F - 2 TG-20-*2 & 4 TG-14-*1	1/4"	3/4	3/4	50.80	66.68
TG-20F - 6 & 8 TG-24T-*6 & 8 TG-20-*6 & 8 TG-14-*2, 3 & 4	1/2"	1	1	66.68	85.73
TG-24T-*12 & 16 TG-20F - 16 TG-18 TG-14-*6 & 8 TG-8	3/4"	1 1/8	1 1/4	73.03	92.08

TGF SERIES



Transducer gland assemblies with fiberglass-insulated thermocouple wire are specially designed for applications where the sensor wire is exposed to process temperatures reaching up to 482° C. This assembly is particularly targeted for use with vacuum and/or inert gas back-filled furnaces with **vessel wall temperatures up to 93.3° C and pressures not exceeding 20 bar.**

CATALOG NUMBERING SYSTEM

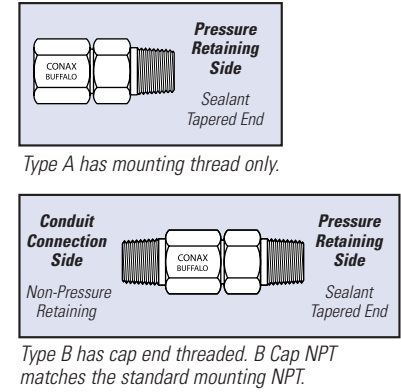
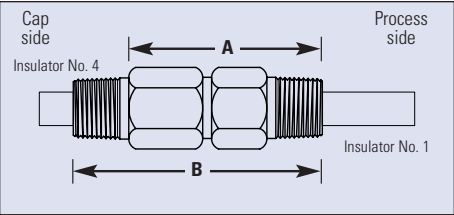
Gland Style	Wire Gauge	Insulation, Body Side	Wire Type	Cap Style	# Elements Sealed	Sealant	Wire Length Cap Side (m)	Exit Wire Insulation	Wire Length Body Side (m)
MTG TG	20 = 20 AWG solid 24 = 24 AWG solid	F – Fiberglass/Silicone Impregnated – use up to 480° C M – High Temperature Fiberglass – Magnesia alumina silicate vitreous fibre braid for Type K, 20 AWG only – use up to 760° C	J – Iron/Constantan K – Chromel/Alumel T – Copper/Constantan E – Chromel/Constantan CU – Copper Wire, 20 AWG only CX – Alloy for Tungsten 5% Rhenium/Tungsten 26% Rhenium, 24 AWG only SX/RX – Copper/Copper Nickel alloy	A – has mounting thread only B – has cap end threaded	2 4 6 8 16	V – Viton T – Teflon		P – Polyolefin F – Fiberglass T – Teflon	

Example: TG-24F(J)-A2-T, 24P/36, TGF

NOTES (CONTINUED)

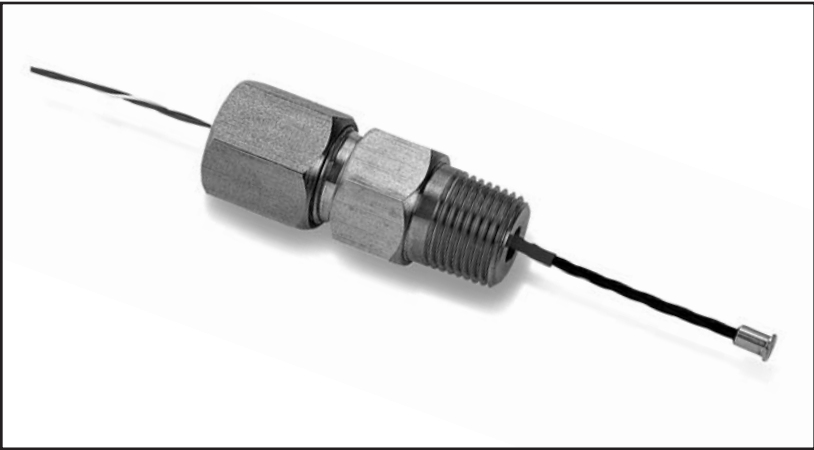
Note 6:
When insulated solid wire is substituted for bare wire, or, it is intended to use wires in sizes other than AWG, tolerance of wire diameter = ±0.076mm (0.003") for wire sizes 24, 20 and 18 AWG; and ±0.127mm (±0.005") for wire sizes 14 and 8 AWG. Deviation from the nominal may affect pressure ratings.

Note 7:
Insulators No's. 1 & 4 are not fitted to TG24T or TGF assemblies.



The assembly consists of bonded fiberglass-insulated/silicone impregnated thermocouple grade wires on the body side, with stripped bare wires passing through the Conax manufactured transducer gland. An alternative high-temperature fiberglass for Type K wire is also available with temperature capabilities up to 760° C. Sleeved insulation material on the wires exiting the cap side may be fiberglass/silicone impregnated, Teflon® or polyolefin.

BEARING SENSOR WIRE SEALS – BSWs



- **SEALS THE LEADS OF EMBEDDED BEARING TEMPERATURE SENSORS**
- **SEALS 2 to 14 WIRES**
- **EASY INSTALLATION - NO POTTING**
- **PRESSURE: To 3.5 bar**
- **TEMPERATURE: Ambient to 37°C**

BSWS Bearing Sensor Wire Seal assemblies are low-temperature, low-pressure glands for embedded bearing temperature sensors to prevent oil wicking along the sensor leads. They seal on the individual insulated leads exiting an oil-filled bearing housing.

Typical applications for BSWS assemblies include:
Motors, turbines, pumps and journal bearing pedestals.

BSWS gland bodies, followers and caps are manufactured from Stainless Steel AISI grades 316L (W.-Nr. 1.4404) and 303 (1.4305).

Installation information and torque settings for glands are shown in the Assembly Instructions, see pages 36 to 41.

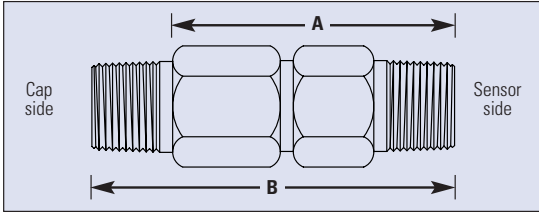
Replacement sealants are available to enable repeated use of fittings.

SPECIFICATIONS, ORDERING INFORMATION

Diameter of wire over insulation (mm)	Number of wires	Gland mounting thread (NPT)	Gland Description [Order Code] (See note 1)
1.1 - 1.5	2 to 8	1/8"	BSWS4-20-* -V
	2 to 14	3/8"	BSWS5-20-* -V
0.94 - 1.3	2 to 8	1/8"	BSWS4-22-* -V
	2 to 14	3/8"	BSWS5-22-* -V
0.81 - 1.14	2 to 8	1/8"	BSWS4-24-* -V
	2 to 14	3/8"	BSWS5-24-* -V
0.71 - 1.04	2 to 8	1/8"	BSWS4-26-* -V
	2 to 14	3/8"	BSWS5-26-* -V
3.12 - 3.23	2 to 4	3/8"	BSWS5-125-* -V

DIMENSIONS

Size of gland	Gland mounting thread (NPT)	Body Hex size (in.)	Cap Hex size (in.)	Length of gland with Type A cap (mm)	Length of gland with Type B cap (mm)
BSWS4	1/8"	1	1	63.50	82.55
BSWS5	3/8"	1 1/8	1 1/4	73.03	92.08



Glands with type 'B' cap have a threaded extension on the cap for a conduit connection. The thread is the same size as the gland mounting thread.

NOTES

Note 1:
The Gland Description [Order Code] shown in the table, is completed by selecting the type of cap required - A or B is inserted at * followed by the number of wires required. (Sealant - Viton only).

Example: BSWS4-20-A4-V
Describes a Bearing Sensor wire seal gland to carry 4 wires of overall diameter in the range 1.1 to 1.5mm. Mounting thread 1/8" NPT.

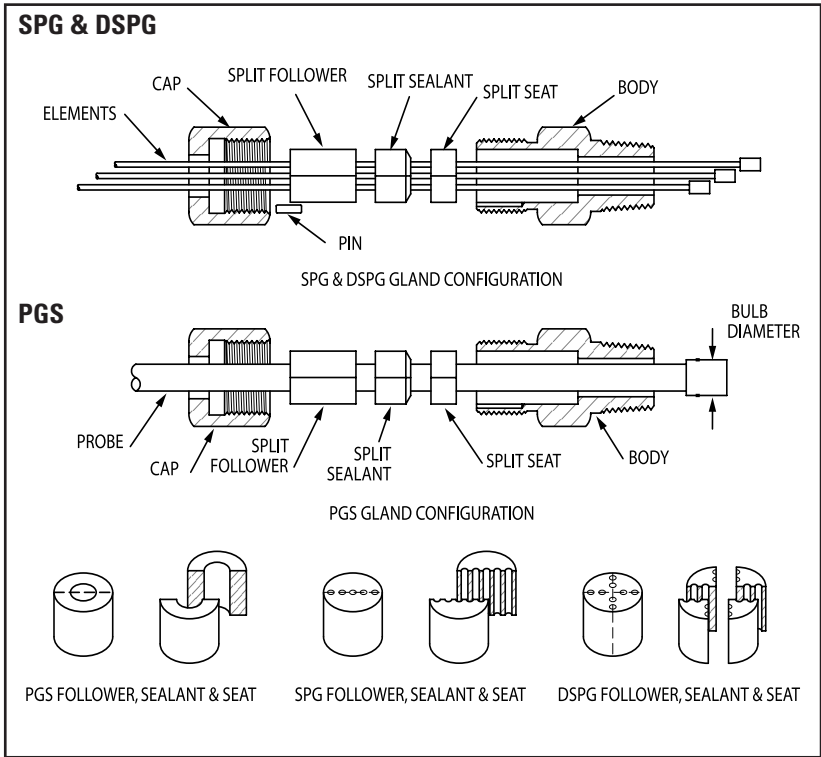
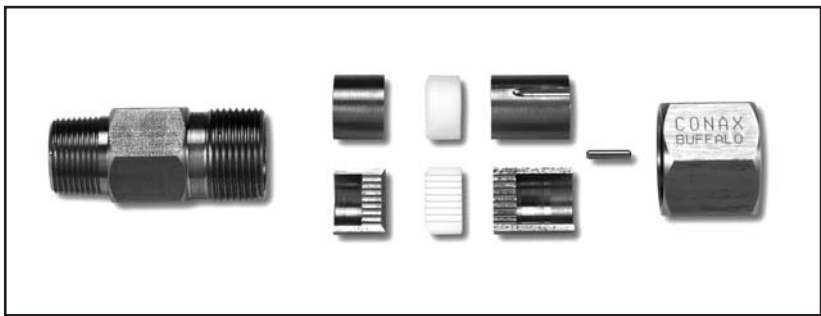
Replacement Sealant Order Code
Example: RS-BSWS4-20-4-V

A range of Miniature Bearing Sensors is available for use in embedded applications where temperature monitoring of bearings is critical to machine performance and reliability.

There are various cap designs and sensor elements may be specified as RTD's (Pt100) and Thermocouple types J, K, T and E.

Contact your Conax Buffalo Technologies representative or our Sales offices for a data sheet and further information.

SINGLE AND MULTIPLE TUBE OR PROBE SEALING –
PGS, SPG, & DSPG GLANDS WITH SPLIT INTERNAL COMPONENTS



PGS, SPG and DSPG glands are pressure and vacuum sealing assemblies where the sealants and the stainless steel followers and seats are split. PGS glands are for a single element and SPG glands are for multiple elements, their internal components have a single split. DSPG glands are for multiple elements and have internal components with a double split.

Applications for PGS, SPG & DSPG glands include: Sealing of single and multiple thermocouples, thermistor probes etc., when the elements to be sealed can pass through the gland body but not through the internal components. For example, process ends of sensors may be of a larger diameter than at the sealing point or there may be connectors to pass through the gland. These glands may also be used if elements are long and difficult to handle, or there are other installation constraints.

PGS, SPG & DSPG gland bodies, followers, caps and seats are manufactured from Stainless Steel AISI grades 316L (W.-Nr. 1.4404) and 303 (1.4305). Other materials may be specified see page 42.

Conax pressure and vacuum sealing assemblies can be specified for use in a range of temperature, pressure and environmental situations by choosing a sealant that is suitable for the application. Replacement split sealants and replacement packing sets (split sealant with split follower and seat) are available to enable repeated use of fittings.

SEALANT SELECTION GUIDE

Sealant (Sealant Code)	Temperature range	Pressure range @ 20°C
Viton (V)	-20°C to +232°C	Vacuum to 690 bar
Teflon (T)	-185°C to +232°C	Vacuum to 550 bar
Lava (L)	-185°C to + 870°C	1bar to 690 bar
Grafoil (G)	-240°C to +495°C (to +1650°C in a reducing atmos.)	Vacuum to 690 bar

- PGS SEALS A SINGLE ELEMENT
- SPG SEALS 2 TO 11 ELEMENTS
- DSPG SEALS 4 TO 17 ELEMENTS
- SPLIT INTERNAL COMPONENTS FOR EASY INSTALLATION
- PRESSURE:
Vacuum to 690 bar
- TEMPERATURE:
-240°C to +870°C
- FOR GAS OR LIQUID
- 'SOFT' SEALANTS REPLACEABLE WITHOUT REMOVING ELEMENTS
- ELEMENTS INDEPENDENTLY ADJUSTABLE
- STAINLESS STEEL FITTINGS

SPECIFICATIONS, ORDERING INFORMATION

PGS GLANDS

Diameter of element to be sealed (See note 3) mm in.	Gland mounting thread (NPT)	Gland Description [Order Code] (See note 1)	Pressure rating by sealant (bar) (See note 3)			
			Viton (V)	Teflon (T)	Lava (L)	Grafoil (G)
0.062	1/4"	PG2S - 062 - * - **	690	220	690	690
0.093	1/4"	PG2S - 093 - * - **	660	130	690	660
	1/2"	PG4S - 093 - * - **	690	690	690	690
3.0	1/4"	PG2S - 118 - * - **	500	95	690	500
	1/2"	PG4S - 118 - * - **	690	690	690	690
0.125	1/4"	PG2S - 125 - * - **	500	95	690	500
	1/2"	PG4S - 125 - * - **	690	690	690	690
0.187	1/4"	PG2S - 187 - * - **	310	60	690	330
	1/2"	PG4S - 187 - * - **	660	500	690	690
	3/4"	PG5S - 187 - * - **	145	170	660	80
6.0	1/4"	PG2S - 236 - * - **	200	50	550	250
	1/2"	PG4S - 236 - * - **	100	165	690	345
	3/4"	PG5S - 236 - * - **	110	130	500	60
0.250	1/4"	PG2S - 250 - * - **	200	50	550	250
	1/2"	PG4S - 250 - * - **	100	165	690	345
	3/4"	PG5S - 250 - * - **	110	130	500	60
0.312	1/2"	PG4S - 312 - * - **	80	135	690	345
0.375	1/2"	PG4S - 375 - * - **	35	95	690	220
	3/4"	PG5S - 375 - * - **	70	80	330	40
0.500	3/4"	PG5S - 500 - * - **	55	65	250	30

SPG & DSPG GLANDS

Maximum number of elements for each diameter of element (See Notes 3, 4 & 5)								Gland mounting thread (NPT)	Gland Description [Order Code] (See note 2)
0.5mm 0.020"	0.032"	1.0mm 0.040"	0.062"	0.093"	0.125"	0.187"	0.250"		
5	4	3	2	2	-	-	-	1/4"	SPG75 -Ø-*.**
7	5	5	4	3	2	-	-	1/2"	SPG100-Ø-*.**
11	10	9	7	5	4	3	2	3/4"	SPG150-Ø-*.**
-	5	5	4	-	-	-	-	1/4"	DSPG75-Ø-*.**
-	9	9	5	5	4	-	-	1/2"	DSPG100-Ø-*.**
-	17	17	13	9	6	5	4	3/4"	DSPG150-Ø-*.**

DIMENSIONS

Size of gland	Gland mounting thread (NPT)	Cap & Body Hex sizes (in.)	Length of gland with type A cap Dim. A (mm)	Length of gland with type B cap Dim. B (mm)	Internal dia. (Max. element dia.) Dim. C mm [in.]
PG2S, SPG75 & DSPG75	1/4"	3/4	50.80	66.68	8.0 [0.32]
PG4S, SPG100 & DSPG100	1/2"	1	65.09	85.73	11.0 [0.45]
PG5S, SPG150 & DSPG150	3/4"	1 1/2	84.14	106.36	19.5 [0.78]

NOTES

Note 1:
The Gland Description [Order Code] shown in the PGS table is completed by selecting the type of cap required - A or B is inserted at *. The code letter for the sealant selected is inserted at **.

Note 2:
The Gland Description [Order Code] shown in the SPG & DSPG table is completed by inserting the diameter of the element required (in thousandths of an inch) at ø.
Select the type of cap required - A or B is inserted at * followed by the number of elements required.
The code letter for the sealant selected is inserted at **.
(See opposite page for sealant information).

Examples: PG4S-093-A-V
SPG75-062-A2-T
DSPG150-125-A6-L

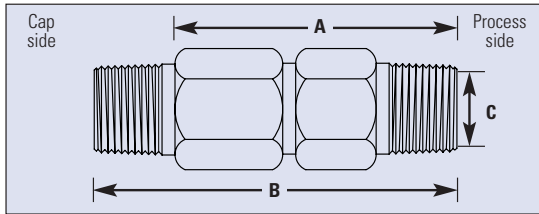
Replacement Sealant Order Code
Examples: RS-PG4S-093-V
RS-SPG75-062-2-T
RS-DSPG150-125-6-L

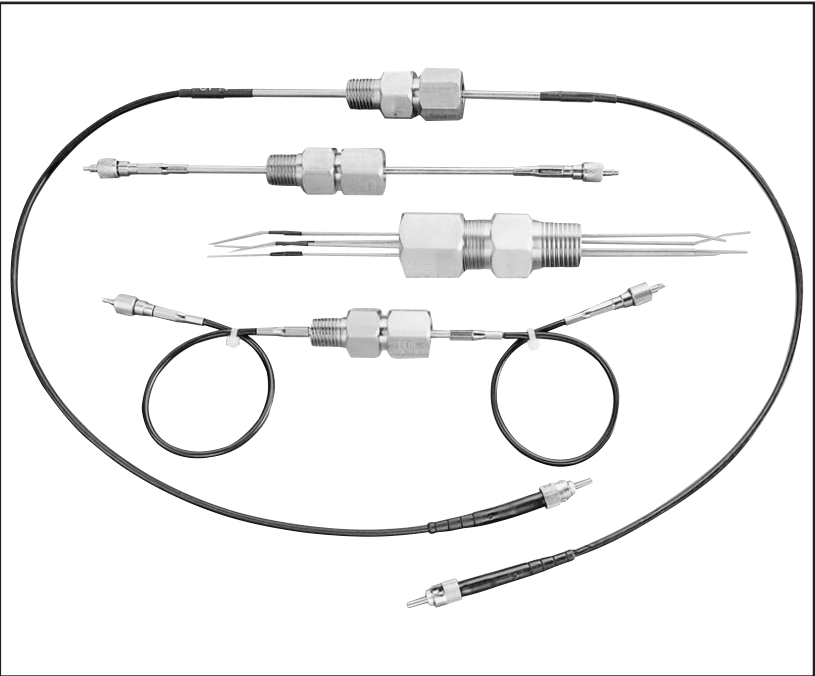
Replacement Packing Set Order Code
Examples: RPS-PG4S-093-V
RPS-SPG 75-062-2-L
RPS-DSPG150-125-6-L

Note 3:
Tolerance of tube or probe diameter = ±0.076mm (0.003") for elements <1.0mm (0.040") and ±0.127mm (0.005") for elements ≥1.0mm. Deviation from the nominal may affect pressure ratings.

Note 4:
SPG and DSPG gland assemblies are not available in all sealant materials and hole densities. SPG75 and all DSPG75 sizes are not available with Grafoil sealants. Where no value is shown in the table the option is not available.

Note 5:
For pressure ratings for SPG & DSPG glands please consult Conax. All pressure and vacuum ratings are determined at 20°C with a stainless steel rod as the element. For vacuum ratings see page 42.





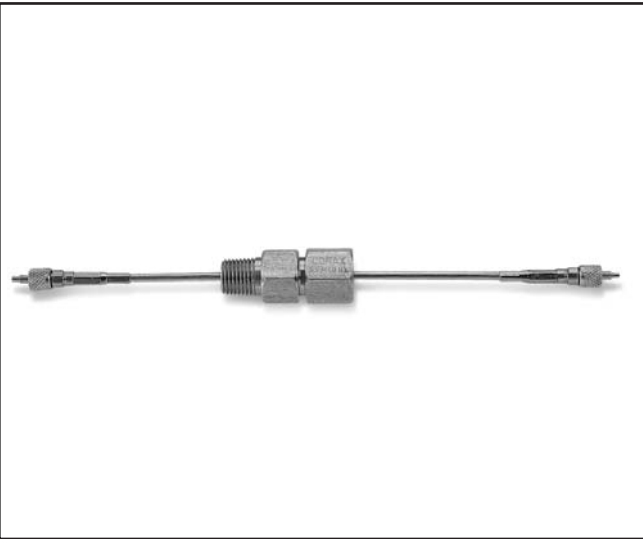
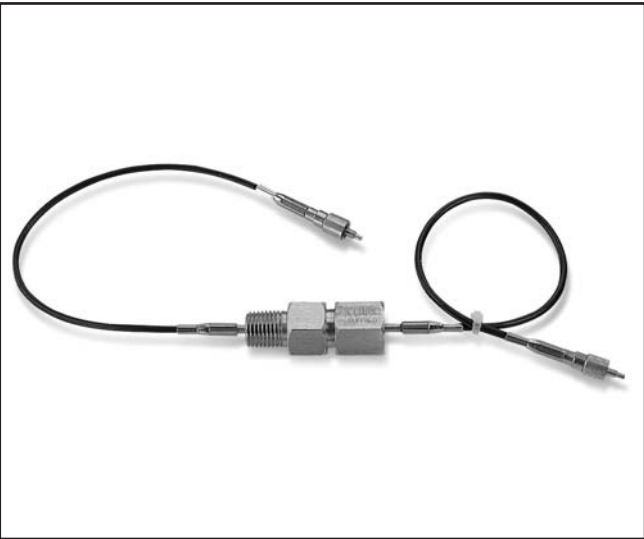
FSA optical fibre sealing assemblies enable a range of sizes of fibre optic cable to pass through environmental boundaries. A lined, stainless steel tube is swaged over an optical fibre cable to make the tube seal. One tube per fibre is used.

Single mode or multi-mode fibres may be housed in the protective tubes. These are employed as complete pressure and vacuum feedthrough assemblies using standard sealing glands PG or PGS glands for single fibres and MHC or MHM glands for multiple fibres.

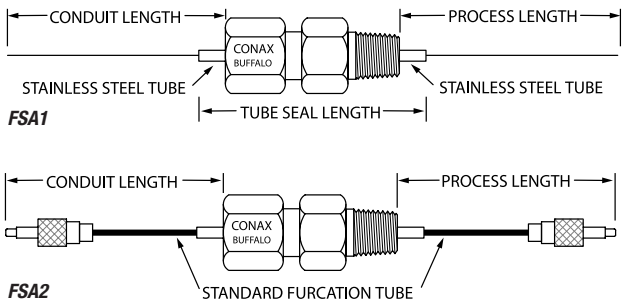
Feedthrough tubes are made from Stainless Steel AISI grades 304 (W-Nr. 1.4301) or 316 (1.4401).

SPECIFICATIONS

Leak rate:	1 x 10 ⁻⁶ scc/sec Helium at 1 Atm typical
Transmission loss:	Less than 0.3dB typical (excluding connectors)
Pressure rating:	70 bar max. @ 20°C
Temperature range:	-20°C to +85°C
Fibre core sizes:	8.3, 62.5, 100, 200, 400, 600 & 700 micron



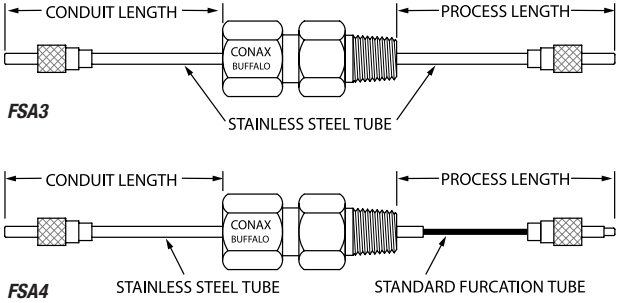
- **SEALED FEEDTHROUGH ASSEMBLIES FOR OPTICAL FIBRE CABLES**
- **SEAL WITHOUT THE USE OF EPOXIES**
- **LOW OUT-GASSING MATERIALS**
- **FIBRE OPTIC CABLE IS PROTECTED INSIDE A STAINLESS STEEL SHEATH**
- **STANDARD SEALING GLANDS FOR MOUNTING**
- **AVAILABLE WITH A CHOICE OF CONNECTORS**



Conax Buffalo Technologies has adapted our proven soft sealant capability to include the ability to compress a soft sealant material around the outside diameter of a fibre optic cable. The fibre optic cable is encased within a rugged stainless steel sheath that protects the cable from damage during the sealing process. This sheath is then placed through a sealing gland. This process allows the fibre optic cable to be sealed without the use of epoxies and with minimal out-gassing. The fibre optic feedthrough sub-assembly can be used with various Conax Buffalo sealing glands, including multiple hole fittings and can be adapted for special applications.

FEATURES

- Wide range of connector terminations: ST, SMA, FC, FC/APC, FC/PC and SC/APC
- Standard fibre core sizes: 8.3, 62.5, 100, 200, 400, 600, 700 micron & larger



- Adaptable to customer-supplied fibre
- Can seal outside jacket diameters from 400 to 1040 microns
- Protection Tubing: Standard furcation tube (black in color) is constructed of a polypropylene inner tube with a dried Kevlar® Aramid yarn strength member and a 3.0 mm outer polyethylene jacket.
- Models FSA2 and FSA4 are available with a low-outgassing furcation tube. Please specify FSA2B or FSA4B for this feature.

SPECIFICATIONS

- Helium Leak Rate: 1 x 10⁻⁶ scc/sec typical
- Transmission Loss: Less than 0.3db typical (not including connectors)
- Pressure Rating: 70 bar standard, up to 207 bar optional
- Temperature Rating: -20° C to +85° C
Higher temperature models are available in some configurations. Please consult factory.

CATALOG NUMBERING SYSTEM

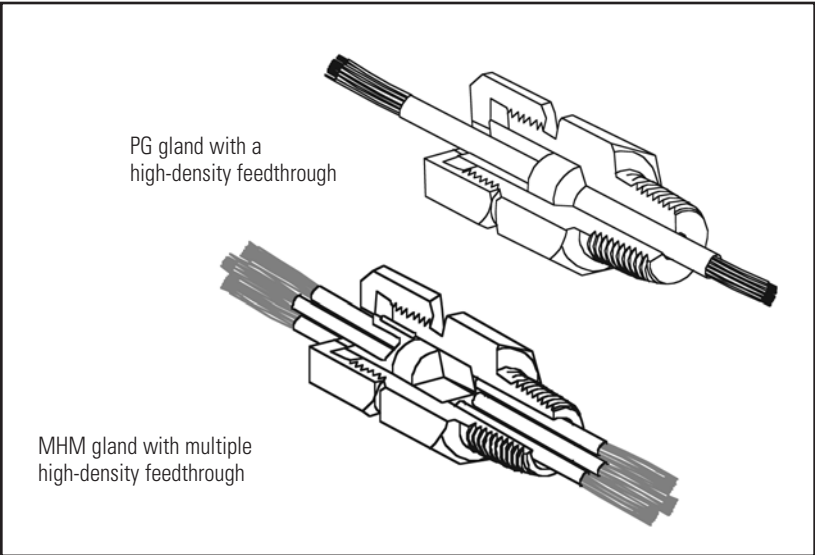
Model Type	Fiber Core Size	Overall Length (mm)	Connector Termination Conduit Side	Connector Termination Process Side
FCA1	0 – 8.3 µm		XX – No Connector	XX – No Connector
FCA1B – low outgassing	1 – 62.5 µm		905 – SMA 905	905 – SMA 905
FCA2	2 – 100 µm		906 – SMA 906	906 – SMA 906
FCA2B – low outgassing	3 – 200 µm		ST – ST	ST – ST
FCA3	4 – 400 µm		FST – ST with female adapter	FST – ST with female adapter
	6 – 600 µm		FC – FC	FC – FC
	7 – 700 µm		FC/PC – FC with PC Polish	FC/PC – FC with PC Polish
	9 – Customer supplied fiber		FC/APC – FC with APC, 8° Angle Polish	FC/APC – FC with APC, 8° Angle Polish
			SC/APC – SC with APC, 8° Angle Polish	SC/APC – SC with APC, 8° Angle Polish

Example: **FCA2B-4-1000-ST/ST**

Model Type Low Outgassing Tube Fiber Core Size Length Connector Termination, Conduit Side Connector Termination, Process Side



- **CONTINUOUS WIRE FEEDTHROUGHS FOR THERMOCOUPLES, RTD'S AND OTHER LOW-VOLTAGE INSTRUMENTATION**
- **12, 24, 40 OR 60, BUNDLED, 24 AWG, TEFLON-COATED COPPER OR THERMOCOUPLE MATERIAL WIRES**



- **NO EPOXY AND NO POTTING**
- **PRESSURE: Vacuum to 345 bar**
- **TEMPERATURE -80°C to +120°C**
- **RATED 100Vdc @ 500mA**
- **SINGLE OR MULTIPLE FEEDTHROUGHS IN A SINGLE SEALING GLAND**

HD feedthrough assemblies comprise a Conax Buffalo Technologies high-density, wire feedthrough sealed with a sealing gland.

A Teflon-lined, stainless steel tube is swaged over 12, 24, 40 or 60, bundled, 24AWG, solid, Teflon-coated insulated, copper and or thermocouple material wires, to make the high-density feedthrough. The swaged tube is mounted in a sealing gland.

Assemblies are supplied with a minimum of 600mm of wire on each side of the feedthrough, longer lengths can be specified to requirements.

Typical applications include sealing of wires exiting pressure vessels, instruments, furnaces, sterilisers and reactors.

Feedthrough tubes are made from Stainless Steel AISI grades 304 (W-Nr. 1.4301) or 316 (1.4401).



DIMENSIONS, SPECIFICATIONS

Feedthrough tube diameter:	4.75mm (HD18) 6.35mm (HD25) 7.92mm (HD31) 9.53mm (HD37)	Pressure rating:	345 bar max. © 20°C For higher pressure applications please consult your Conax representative or our Sales offices. For vacuum rating see page 42.
Tube length:	114mm	Leak rate:	1 X 10 ⁻⁹ scc/sec, Helium at 20°C, 1 Atm. supplied
Voltage / current rating:	100Vdc / 500mA	Vacuum Rating:	5 X 10 ⁻³ mtorr @ 20°C
Temperature range:	-80°C to +120°C		

CATALOG NUMBERING SYSTEM

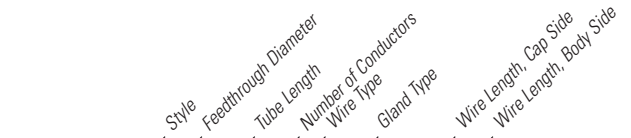
Style	Feedthrough Diameter	Tube Length	Number of Conductors	Wire Type	Gland Type (Optional)	Wire Length Cap Side (m)	Wire Length Body Side (m)
HD	18 – 0.187" OD 25 – 0.250" OD 31 – 0.312" OD 37 – 0.375" OD	450 - 4.5" <i>Custom tube lengths also available.</i>	12 – for HD18 = 12 total conductors or 6 T/C pairs 24 – for HD25 = 24 total conductors or 12 T/C pairs 40 – for HD31 = 40 total conductors or 20 T/C pairs 60 – for HD37 = 60 total conductors or 30 T/C pairs	J – Iron/Constantan K – Chromel/Alumel T – Copper/Constantan E – Chromel/Constantan CU – Copper Wire	<i>Select a gland with a bore size that fits the feedthrough diameter. See the appropriate catalog section for proper gland callout. If gland is not required, omit gland callout. Will accept PG, MK, MHM or split gland.</i>		

Consult factory for CX, RX/SX, or other wire type combinations.

NOTES

Note 1:
Any combination of thermocouple pairs and single copper wires may be specified. Copper wires are counted individually and thermocouple wires are counted as pairs.

Note 2:
To specify a combination of different types of thermocouple pairs and copper wires, identify the combination required in the style of the following examples:



Example: HD25-450(12K)PG2AT, 0.6m/0.6m (with gland)

Example: HD25-450(6K/12CU), 0.6m/2.0m (without gland)

Example: HD25-450(24CU)MHM5A4T, 1.0m/1.0m (with multiple feedthrough gland)

T/C pairs and individual copper wires are marked on each side of the feedthrough for identification.

Note 3:
For wire types R, S, B and C contact Conax Buffalo Technologies.

Note 4:
Conax® Buffalo Technologies can provide numerous options for the management of wires in our sealing assemblies:

- Wire Markers with customer nomenclature for easy wire identification of multiple wires
- Twisting of wires in pairs or other groupings for easier identification and management
- Wire Jackets/Sleeving
- Hot Junctions – exposed or encapsulated

Please consult your Conax Buffalo Technologies sales engineer for details.



Conax Buffalo Technologies manufactures high pressure seals [up to 2070 bar at 20° C] for instrument signal wires. High pressure seals are designed for installation onto the pressure vessel wall using threaded mounting configurations only. High pressure assemblies are factory torqued, so disassembly and reassembly in the field is not recommended.

These assemblies feature body and caps constructed from high strength 316SST and a proprietary sealant. HPPL assemblies are provided with Kapton-insulated 26 gauge solid copper wire. Standard assemblies include 0.6m of wire on each side. To order other wire lengths, indicate the desired lengths after the catalog number.

A 1/2" NPT thread can be added to the assembly cap to allow mounting a terminal box or other type of enclosure. Consult factory for ordering details.

For other types of high pressure applications such as electrode sealing, please consult the factory.

Example: **HPPL14(AM3/S316B)-26-A/(S316B)2-CGL, 0.6m/0.6m**

Specifications – High Pressure Assemblies

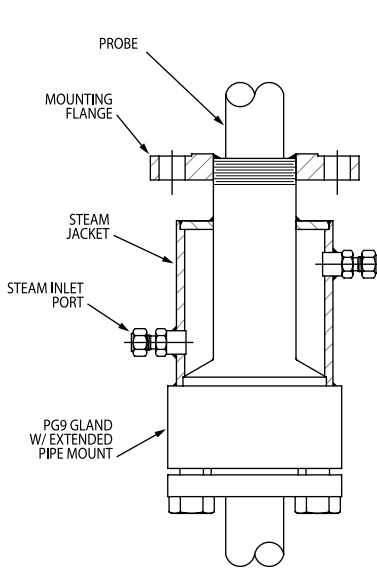
Catalog Number	Wire Gauge	Number of Wires	Length	Thread Size	Hex Size Body (Cap)	Pressure Rating (bar)
HPPL14(AM3/S316B)-26-A/(S316B)2-CGL	26	2	76.2mm	3/4-16	1 (1-1/4)"	2,070
HPPL14(AM3/S316B)-26-A/(S316B)4-CGL	26	4	76.2mm	3/4-16	1 (1-1/4)"	2,070
HPPL14(AM3/S316B)-26-A/(S316B)7-CGL	26	7	76.2mm	3/4-16	1 (1-1/4)"	2,070
HPPL8(AM5/S316B)-26-A/(S316B)10-CGL	26	10	76.2mm	1 1/8-12	1 (1-1/4)"	2,070

Note: HPPL14 mates with Snap-tite/Autoclave Engineers part type F-375-C. HPPL8 mates with Snap-tite/Autoclave Engineers part type F-562-C.



Quick Mount Coupler

Quick Mount Couplers provide a quick and positive method to remove and reseal multiple wires and probes. They eliminate the twisting or entangling of long leadwires caused by rotation while screwing the fitting into place. Assemblies can be provided for pressure applications up to 415 bar.



Steam Jacketed Sealing Assemblies

All Conax Buffalo sealing assemblies can be jacketed to allow the assembly to be heated or cooled. Heating is generally used to avoid cooling or crystallization of hot viscous media flowing around the assembly and to enhance flow. Cooling is sometimes needed in applications

where the temperatures radiating from the process could exceed the sealant rating or the heated gland has the potential to burn workers if touched. Jackets are constructed from rugged stainless steel and provide inlet and outlet ports to allow the steam or coolant to circulate around the gland body.



Lock Wire Assemblies

Conax Buffalo Technologies can supply any hex-style sealing assembly with holes drilled through the hex corners of the cap and body. This allows a wire to be inserted and sealed after torquing to prevent unauthorized release of the torque and/or probe adjustment. This may be done for safety reasons or to ensure that the cap does not back off in ultra high vibration applications.



TG Assembly for Light Gases

The TG-20-14 is a specialized TG assembly for sealing light gases where reduction of potential leak paths is critical. This assembly provides a 1/2 NPT mounting port rather than the 1/4 NPT normally found on the TG-20. This eliminates the need for a reducer bushing and eliminates a potential leak path. The assembly uses 20 gauge wire and is available as a 2- or 4-hole assembly. The TG-20-14 can be fitted with any Conax Buffalo flange, thread or weld mount.

Customized Flange Mounts

In addition to our standard CF, KF, SFA and ASME/ANSI flange mounts, specialized mounts such as tube flares, integral flanges and custom shapes can be provided to easily adapt Conax Buffalo's proven sealing techniques to your process equipment requirements. Consult your Conax Buffalo sales engineer for details.



High Temperature PL Assembly

Conax Buffalo Technologies offers a high temperature version of the PL Series for use in furnaces with oxidizing atmospheres. In place of the traditional Kapton-insulated copper wire, which has a maximum operating temperature of 232° C (450° F), this PL assembly uses Kapton-insulated Alumel® wire covered with Fiberglass or Refrasil® insulation on the process side. The operating temperature of the PL gland with Grafoil sealant is 232° C (450° F), but the wires that are exposed to the process operate up to 482° C (900° F) with the fiberglass insulation or 982° C (1800° F) with the Refrasil insulation. This PL assembly is normally offered with 18 gauge wire. Please contact the factory for application guidelines. These assemblies can be fitted with any Conax Buffalo flange, thread or weld mount.

The standard ranges of sealing gland assemblies shown in this catalogue, can be customised through the choice of special sealants, the use of materials other than AISI grades 316L and 303 stainless steel for bodies and other components; and by specifying optional mounting and cap threads.



Diverse mounting styles

Conax sealing glands can be customised for ‘O-ring’, flared tube or flange mounting. This diversity enables our engineers to adapt our proven sealing techniques with ease, to individual process equipment requirements for pressure, vacuum and environmental sealing applications.



Hazard environment sealing

The Conax HL gland is designed for sealing protection in a wide variety of hazardous environments. The HL Gland has been CSA® certified in the US and Canada for use in hazardous locations defined by the NEC® as Class I Groups B, C, and D, Class II Groups E, F and G, and Class III.

HL Glands are suitable for gas or liquid, feature a Grafoil® sealant, come in two sizes (small 1/2" NPT and large 3/4" NPT), provide a temperature range from -20°C to + 55°C and are atmospheric to 35 bar.

This sealing gland is designed to replace Chico® and other similar conduit sealing compound fittings commonly used in hazardous environments. With a mechanically-sealed Conax HL gland, you will not have to be concerned about cracks that allow gases or liquids to leak, causing corrosion to instrumentation and the potential for explosive gases of liquid to ignite when in the presence of instrumentation.

In addition to these variations, glands can be provided for non-threaded mounting and for specific applications where standard gland designs, or modified versions, cannot meet customers’ requirements. Various examples of our design and manufacturing expertise are shown below.



The sealing glands presented in this catalogue are all available in direct weld-mounting designs. This is achieved by machining of the standard mounting thread on glands, or, by manufacturing glands with weld-necks to precisely the length and diameter required. This option is often required for high-vacuum applications or where thread-free mounting is needed.



Electrode sealing

(a) This EG-750 gland was designed for installing large power leads into vacuum chambers. It is rated from 6.67 x 10⁻⁴ Pa to 12.5 MPa (125 bar). This gland was initially designed as a special development for a specific application. It is now a standard product in the EG range of electrode sealing assemblies (see page 14).

(b) This custom-made 25mm dia. gland was designed and manufactured to carry 4kV ac at 230°C in high vacuum.

REPLACEMENT SEALANTS

The replaceable sealant used in Conax Buffalo sealing assemblies allows repeated use of the same fitting. Replacement sealants are available in Neoprene, Viton, Teflon, Lava or Grafoil, depending on the sealing assembly type. Instructions on how to order replacement sealants are provided in the catalog section for the appropriate gland series.



REPLACEMENT PACKING SETS

Replacement Packing Sets for MHC, TG, PL and EG series assemblies consist of one replacement sealant with the appropriate number of ceramic insulators for that specific assembly.



Replacement Packing Sets for MHM, SPG, DSPG and PGS series assemblies consist of one replacement sealant with a seat and follower.

Replacement sealants provided in the packing sets are available in Neoprene, Viton, Teflon, Lava or Grafoil, depending on the sealing assembly type. Instructions on how to order replacement packing sets are provided in the catalog section for the appropriate gland series.

REPLACEMENT INSULATORS

In addition to Replacement Packing Sets, Conax Buffalo can supply individual Alumina (AL₂O₃) Ceramic Insulators appropriate for use with copper wire, thermocouple wire for thermocouple calibrations J, K E, T, R, S, B and C, or electrodes.



To order replacement insulators, order Insulator, (Gland) – (Wire Gauge) – (Number of Holes)

Example: Insulator, TG-20-2

Please specify if the insulators are to be used with Grafoil sealants.

REPLACEMENT CONDUCTORS/ELECTRODES

Conax Buffalo supplies conductors/ electrodes for Conax EG and EGT assemblies in stainless steel, copper or nickel and in sizes from 0.093" to 1.00". Each set is supplied with 4 nuts and 4 washers.



To order replacement electrode, order Conductor, (Gland) – (Diameter) – (Material)

Example: Conductor, EGT-093-CU

Electrode	Amperage Rating	Nuts/Washers
Copper	20 to 525 amps	Brass
Nickel	8 to 240 amps	Stainless Steel
Stainless Steel	3 to 72 amps	Stainless Steel

POWER LEAD/INSULATED WIRE

Conax Buffalo can supply bulk Kapton-insulated, solid conductor power lead wire, rated to 600 volts, in wire gauges from 20 to 8. Minimum order is 15m.



Part Number	Gauge
44-0098-020-CU	20
44-0098-018-CU	18
44-0098-016-CU	16
44-0098-014-CU	14
44-0098-012-CU	12
44-0098-010-CU	10
44-0098-008-CU	8

THREAD SEAL MATERIALS

Use of mounting thread environmental seal materials maximizes the efficiency of the NPT seal. Conax Buffalo recommends Teflon tape for use up to 232° C (450° F) and Grafoil tape for use between 232° C (450° F) and 482° C (900° F).



Part Number	Material	Width	Length of Roll	Temperature Range
44-0135-001	Teflon	0.5"	12.0m	-184° C to +232° C (-300° F to +450° F)
47-0040-001	Grafoil	0.5"	7.5m	-240° C to +496° C (-400° F to +925° F)

SEALING GLAND LUBRICATION KIT

Conax Buffalo Technologies sealing assemblies are supplied factory lubricated. This lubricant is used on the internal cap threads and followers to reduce friction at metal-to-metal contact points and to ensure maximum transfer of torque for sealant compression when screwing the assembly together. If cleaned before assembly or any time the gland is loosened and retorqued, the assembly should be relubricated. The same lubricant used by the factory can be purchased in small, one-application disposable packages with the applicator included. The use of this convenient kit ensures consistent sealing performance without the need to purchase and store large quantities of lubricant.

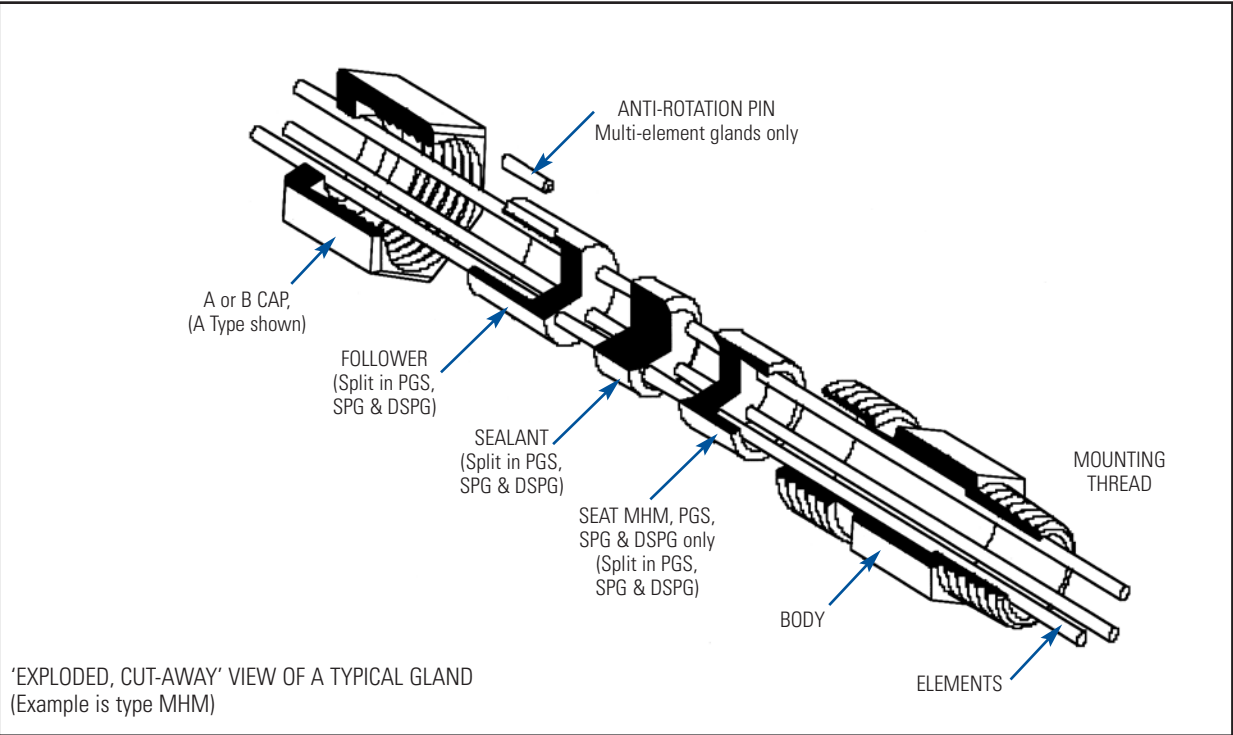


CAUTION: CONAX BUFFALO TECHNOLOGIES SEALING GLANDS SHOULD BE INSTALLED BY SUITABLY QUALIFIED PERSONNEL IN ACCORDANCE WITH RELEVANT HEALTH & SAFETY RULES AND WITH PROPER REGARD TO SAFE WORKING PRACTICES.

Please read the following notes before installation.

1. These assembly and installation instructions assume that there is free access to the process end(s) of element(s) and that the assembly of glands can be undertaken before mounting in an enclosure or vessel. Unless otherwise stated, element(s) and components are inserted into gland bodies from the cap thread end. If access is restricted to the opposite end(s) of element(s), if it is necessary to mount the gland body before assembly, or, there are other installation constraints, it may be necessary to change the order in which the gland components are fitted. Refer to the relevant sealing gland diagram.
2. Unlike conventional compression fittings, Conax gland caps are tightened to a specified torque setting for each type and size of gland, according to the sealant material used. Refer to the Torque tables for each type of gland. If glands are over-torqued probes or wires may be deformed or broken. If glands are undertorqued the desired seal may not be achieved or the maximum pressure rating will not be achieved. A torque wrench should be used.
3. Gland caps may be slackened to adjust element(s) or disassembled to remove element(s) or replace sealants and insulators without removing the gland body from the installation. (Except EG and EGT glands and other installations where the elements cannot pass through the gland body).

4. When gland bodies must be mounted in the vessel or enclosure before assembly, and where installed glands are slackened or disassembled, glands must be torqued or re-torqued when assembled or re-assembled, using a torque wrench on the cap and a spanner or wrench on the gland body hex. flats. Glands should not be torqued against the vessel or enclosure mounting. Thread tape is recommended for use on gland mounting threads. PTFE or Teflon tape is commonly used for temperatures to 232°C, Grafoil tape may be used for higher temperatures. (See page 35).
5. Gland threads, followers and the inside top face of caps have lubricant applied during manufacture to prevent galling (binding) between component parts. Gland components should not be de-greased prior to assembly and installation. Substitution of factory applied lubricant will affect gland torque values. The same lubricant that is applied to each new gland shipped from the factory, is available in a single-application, disposable applicator package. Whenever a gland is opened for adjustment or replacement of the element(s) or sealant, it is recommended that this lubricant is re-applied. (See page 35).
6. Glands must not be slackened or disassembled while an installation is in use - under pressure, vacuum or other working conditions. Stub elements to close unused holes in multi-element glands must be restrained to prevent unwanted ejection.



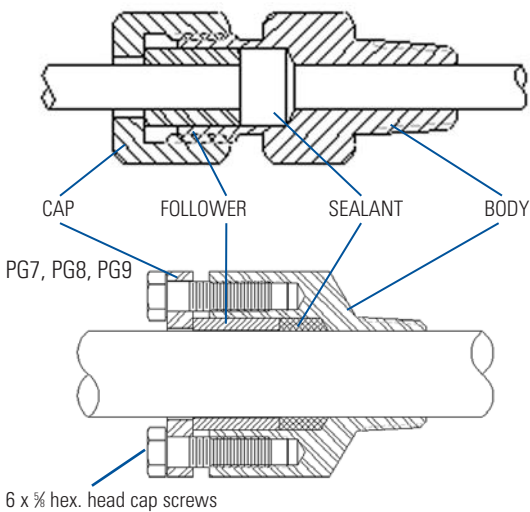
PG GLANDS (INCLUDING MIC AND MPG GLANDS)

1. Identify the type of gland to be assembled. Verify that the total length of the element to be installed is such that it provides a sufficient length for desired immersion and leads.
2. Place the cap and then the follower over the element (refer to the gland diagrams).
3. Ensure that the correct sealant has been chosen for use at the working pressure, temperature and process environment. Place the sealant over the element.
4. Using a vice, secure the gland body in a vertical position, cap end uppermost. Insert the element through the gland body and slide the follower and sealant into the gland body. Ensure that the sealant is seated.
5. Thread the cap on to the body until finger tight (6 x hex. head cap screws on PG7). Adjust the immersion length of the element to the desired position. Using a torque wrench, tighten the cap to the specified torque shown in the Torque table for the size of gland and sealant used. Cap screws on PG7 to be progressively tightened in the order 1-4-2-5-3-6.
6. The assembly is now ready for mounting in the vessel, housing or enclosure. Tighten the gland body using a spanner or wrench on the gland body flats - not on the cap.

MHC GLANDS

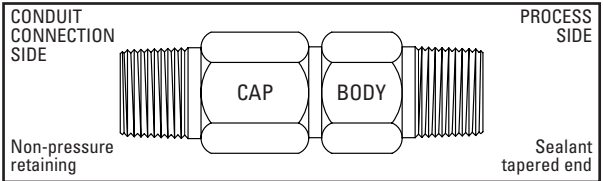
1. Identify the type of gland to be assembled. Verify that the total length of the element(s) to be installed are such that they provide sufficient length for desired immersion and leads.
2. Place the cap and then the follower over the element(s) (refer to the gland diagrams).
3. Ensure that the correct sealant has been chosen for use at the working pressure, temperature and process environment. Slide insulator 2, then the sealant, then insulator 1 over the element(s), there are individual holes in these components for each element.
4. Using a vice, secure the gland body in a vertical position, cap thread uppermost. Insert the element(s) through the gland body and slide the insulators, sealant and follower into the body.
5. Ensure that insulator 1 is pushed in until it is stopped by the shoulder in the gland. Ensure that the sealant is seated and that insulator 2 fits inside the follower. As the follower enters the gland body rotate the assembly so that the anti-rotation pin keyways in the body and the follower are aligned. Insert the pin and push in the follower - ensuring that the elements are correctly positioned.
6. Thread the cap on to the body until finger tight. Adjust the immersion length of the element(s) to the desired position(s). Using a torque wrench, tighten the cap to the specified torque shown in the Torque table for the size of gland and sealant used.
7. The assembly is now ready for mounting in the vessel, housing or enclosure. Tighten the gland body using a spanner or wrench on the gland body hex. flats - not on the cap.

PG glands except PG7, PG8 & PG9



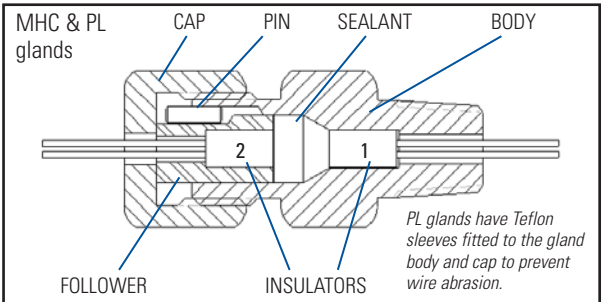
TORQUE TABLE (Nm) – PG GLANDS

Sealant	N / V	T	L	G
MIC	-	0.79 - 1.02	5.08 - 5.65	-
MPG	6.21 - 6.78	6.21 - 6.78	8.47 - 9.04	6.21 - 6.78
PG2	40.8 - 47.6	20.4 - 27.2	54.4 - 61.2	47.6 - 54.4
PG4	74.8 - 81.6	74.8 - 81.6	170 - 190	122 - 136
PG5	74.8 - 81.6	122 - 136	272 - 299	122 - 136
PG6	224-231	407 - 441	-	-
PG7	47.6 per cap screw			
PG8, PG9	Consult Factory			



TORQUE TABLE (Nm) – MHC GLANDS

Sealant	N / V	T	L	G
MHC1	27.2 - 34.0	27.2 - 34.0	40.8 - 47.6	34.0 - 40.8
MHC2-020 & -032	34.0 - 40.8	40.8 - 47.6	54.4 - 61.2	47.6 - 54.4
MHC2-040 & -062	34.0 - 40.8	40.8 - 47.6	54.4 - 61.2	54.4 - 61.2
MHC4	61.2 - 68.0	68.0 - 74.8	170 - 190	122 - 136
MHC5	102 - 116	102 - 116	272 - 299	204 - 224



MHM, PGS, SPG AND DSPG GLANDS

1. Identify the type of gland to be assembled. Verify that the total length of the element(s) to be installed are such that they provide sufficient length for desired immersion and leads.

Note: Where PGS, SPG and DSPG glands are to be assembled with element(s) that have a larger section than at the point where they pass through the gland, e.g., a bulb or there are fitted connectors; ensure that the largest dimension will pass through the gland body and cap (allowing for the dimensions of the other elements to be fitted, if applicable). (Refer to the table opposite for maximum dimensions).

2. Ensure that the correct sealant has been chosen for use at the working pressure, temperature and process environment.

MHM glands

3a. Place the cap over the element(s). Slide the follower, then the sealant, then the seat over the element(s), there are individual holes in these components for each element. (Refer to the gland diagrams).

4a. Using a vice, secure the gland body in a vertical position, cap thread uppermost. Insert the element(s) through the gland body and slide the seat, sealant and follower into the body.

PGS, SPG, & DSPG glands

3b. Using a vice, secure the gland body in a vertical position, cap thread uppermost. Pass the element(s) through the gland body and the cap. This can be done from either direction. (Refer to the gland diagrams).

4b. Assemble the split parts of the seat around the element(s) and slide the seat into the gland body. Repeat this procedure for the split sealant and then the split follower.

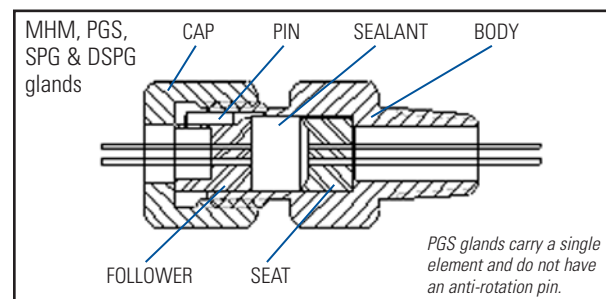
5. As the follower enters the gland body rotate the assembly so that the anti-rotation pin keyways in the body and the follower are aligned. Insert the pin and push in the follower - ensuring that the elements are correctly positioned. (Not applicable to PGS)

6. Thread the cap on to the body until finger tight. Adjust the immersion length of the element(s) to the desired position(s). Using a torque wrench, tighten the cap to the specified torque shown in the Torque table for the size of gland and sealant used.

7. The assembly is now ready for mounting in the vessel, housing or enclosure. Tighten the gland body using a spanner or wrench on the gland body hex. flats - not on the cap.

HD AND FSA ASSEMBLIES

Type HD high-density, wire feedthrough assemblies when ordered with glands, are despatched from the factory with glands already assembled on the feedthrough but loose (untorqued). Type FSA optical fibre feedthrough assemblies, when ordered with glands, are despatched from the factory with glands already assembled and torqued to the correct value. These assemblies are ready for installation. It is not necessary to re-torque these glands.



Size of gland	Internal dia. (Max. element dia.) mm [in.]
PG2S, SPG75 & DSPG75	8.0 [0.32]
PG4S, SPG100 & DSPG100	11.0 [0.45]
PG5S, SPG150 & DSPG150	19.5 [0.78]

TORQUE TABLE (Nm) - MHM GLANDS

Sealant	N / V	T	L	G
MHM2	34 - 41	34 - 41	34 - 41	34 - 41
MHM4	109 - 122	109 - 122	170 - 190	150 - 163
MHM5	163 - 177	204 - 224	272 - 299	238 - 258
MHM6	41-47	41-47	—	41-47

TORQUE TABLE (Nm) - PGS GLANDS

Sealant	N / V	T	L	G
PG2S	40.8 - 47.6	28.4 - 27.2	54.4 - 61.2	47.6 - 54.4
PG4S	74.8 - 81.6	74.8 - 81.6	170 - 190	122.4 - 136
PG5S	74.8 - 81.6	122.4 - 136	272 - 299	122.4 - 136

TORQUE TABLE (Nm) - SPG & DSPG GLANDS

Sealant	N / V	T	L	G
SPG75 & DSPG75	34.0 - 40.8	34.0 - 40.8	34.0 - 40.8	34.0 - 40.8
SPG100 & DSPG100	108 - 122	108 - 122	170 - 190	150 - 163
SPG150 & DSPG150	163 - 177	204 - 224	272 - 299	238 - 306*

* When torquing elements of 1.0mm (0.040") dia. or less with Grafoil sealants, initially torque to 299Nm. After 24 hours re-torque to 306Nm.

HD and FSA assemblies may be specified with PG or PGS glands for single feedthroughs, or MHC (FSA only), MHM, SPG and DSPG glands for multiple feedthroughs. Refer to the assembly and installation instructions for the relevant gland type used when installing or re-assembling HD and FSA feedthroughs in their mounting glands.

EG AND EGT GLANDS

EG and EGT glands are despatched from the factory already torqued to the correct value and ready for installation. It is not necessary to re-torque these glands. The following instructions apply to glands that are to be re-assembled, have been ordered to be hand tightened only, or without electrodes.

1. Identify the type of gland to be assembled. Ensure that the correct sealant and electrode material have been chosen for use at the working voltage, current, pressure, temperature and process environment. Remove the nuts and washers from the electrode.

EG glands

2a. Place one ceramic insulator over the electrode or alternative element. Place the sealant* followed by the second ceramic insulator over the electrode.

EGT glands

2b. Place the Teflon, combined sealant/insulator over the electrode.

3. Using a vice, secure the gland body in a vertical position, cap thread end uppermost.

4. Insert the insulators, sealant* and electrode (EG) or the combined, sealant/insulator and electrode (EGT) as assembled, into the cap thread end of the gland body until the ceramic insulator or Teflon insulator/sealant is stopped by the shoulder in the gland. Hold the electrode to prevent it from dropping through.

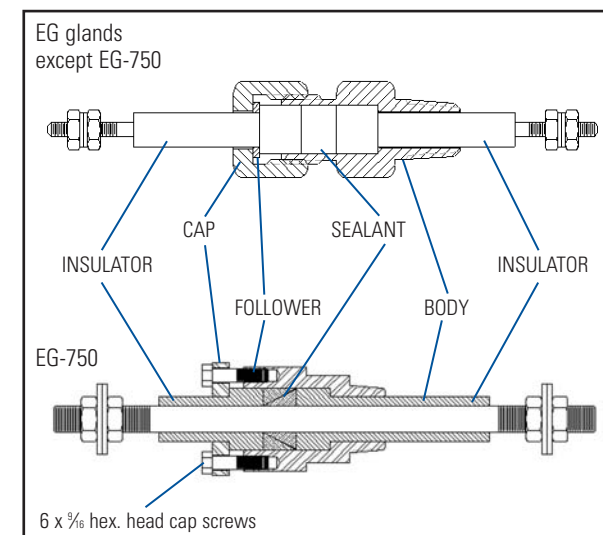
* Note: EG-375 and EG-500 Lava sealants are two-piece mating cone and cup designs. Insert the cup tapered end up and the cone tapered end down.

5. Insert the follower. Seat the undercut edge to the face of the insulator (EG). Thread the cap on to the body until finger tight (6 x hex.head cap screws on (EG-750).

6. Make the final electrode adjustment, ensuring that the ceramic insulators or sealant/insulator are firmly seated and aligned. Using a torque wrench, tighten the cap to the specified torque shown in the Torque table for the size of gland and sealant used. (Cap screws on EG-750 to be progressively tightened in the order 1-4-2-5-3-6). Extreme care should be taken when torquing EG glands. Caps should be tightened slowly and smoothly to the recommended torque setting.

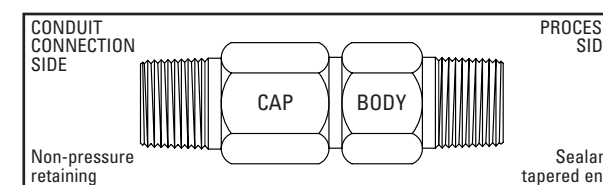
7. Install the nuts and washers at each end of the electrode. The assembly is now ready for mounting in the vessel, housing or enclosure. Tighten the gland body using a spanner or wrench on the gland body flats - not on the cap.

8. Make the electrical connections to the electrode using ring-tongue, lug-type or spade terminals. These are positioned between the washers, the nuts should be tightened securely. Application of a proprietary, self-setting locking fluid or paste to the electrode threads and nuts is recommended, particularly when the assembly may be subject to wide temperature variations or vibration.



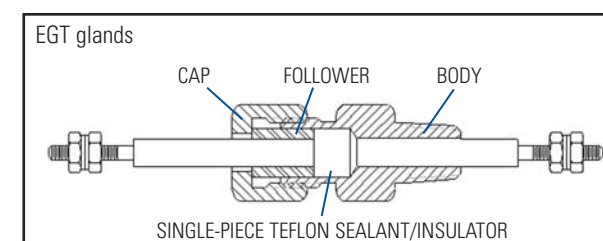
TORQUE TABLE (Nm) - EG GLANDS

Sealant	N / V	T	L
EG-093	23.1 - 27.2	23.1 - 27.2	13.6 - 16.3
EG-125 & -187	34.0 - 40.8	34.0 - 40.8	34.0 - 40.8
EG-250	54.4 - 61.2	54.4 - 61.2	81.6 - 88.4
EG-312	47.6 - 54.4	47.6 - 54.4	68.0 - 74.8
EG-375 & -500	68.0 - 74.8	68.0 - 74.8	245 - 272*
EG-750	-	13.6 - 16.3 per cap screw	34.0 - 40.8 per cap screw



TORQUE TABLE (Nm) - EGT GLANDS

Sealant	T
EGT-093	6.80 - 8.16
EGT-125	13.6 - 20.4
EGT-187 & -250	34.0 - 40.8
EGT-375 & -500	47.6 - 54.4
EGT-750	102 - 109
EGT-1000	6.1 - 6.8 per bolt



PL GLANDS, TGF AND TG24T ASSEMBLIES

PL Glands, TGF, and TG24T assemblies, ordered with specified wire lengths, are despatched from the factory already torqued to the correct value and ready for installation. It is not necessary to retorque these glands.

TG GLANDS

1. Identify the type of gland to be assembled. Verify that the total length of the element(s) to be installed are such that they provide sufficient length for desired immersion. Place the cap over the element(s) (refer to the gland diagram).

2. Ensure that the correct sealant has been chosen for use at the working pressure, temperature and process environment. Slide insulator 4, then the follower, then insulator 3, followed by the sealant, over the element(s). For gland sizes MTG, TG-24-2, TG-24-4, TG-20-2, TG-20-4 and TG-14-1 only, slide insulator 1 over the element(s). There are individual holes in the insulators and sealant for each element.

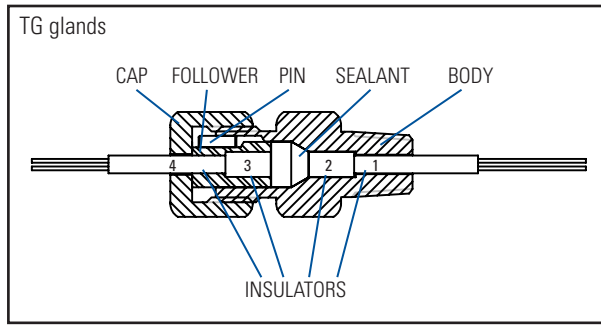
3. Using a vice, secure the gland body in a vertical position, cap thread uppermost. Insert the element(s) through the gland body and slide the insulators, sealant and follower into the body.

4. Ensure that insulator 2 is pushed in until it is stopped by the shoulder in the gland. Ensure that the sealant is seated and that insulator 3 fits inside the follower. As the follower enters the gland body rotate the assembly so that the anti-rotation pin keyways in the body and the follower are aligned. Insert the pin and push in the follower - ensuring that the elements are correctly positioned. For all other gland sizes, not identified in 3. above, slide insulator 1 over the elements and push it into the gland body from the process side until it is stopped by the shoulder in the body.

5. Thread the cap on to the body until finger tight. Adjust the immersion length of the element(s) to the desired position(s). Using a torque wrench, tighten the cap to the specified torque shown in the Torque table for the size of gland and sealant used.

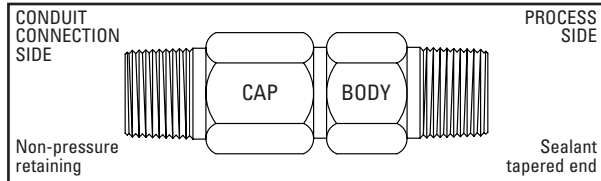
6. The assembly is now ready for mounting in the vessel, housing or enclosure. Tighten the gland body using a spanner or wrench on the gland body hex. flats - not on the cap.

For PL glands that are to be re-assembled, have been ordered to be hand tightened only, or are supplied without wires, refer to the assembly instructions and gland diagram for MHC glands.



TORQUE TABLE (Nm) – TG GLANDS

Sealant	N/V	T	L	G
MTG	27.2 - 34.0	27.2 - 34.0	40.8 - 47.6	34.0 - 40.8
TG-24 TG-20-2 & -4	34.0 - 40.8	40.8 - 47.6	54.4 - 61.2	47.6 - 54.4
TG-14-1	34.0 - 40.8	40.8 - 47.6	54.4 - 61.2	54.4 - 61.2
TG-20-6 & -8 TG-18 TG-14-2, -3 & -4	61.2 - 68.0	68.0 - 74.8	170 - 190	122 - 136
TG-20-16 TG-14-6 & -8 TG-8	102 - 116	102 - 116	272 - 299	204 - 224



BSWS GLANDS

1. Identify the type of gland to be assembled. If the sensor leads have an outer insulation or sleeve, trim this back to the point where it will enter the gland body when installed (see diagram) - thus exposing the individual insulated leads.

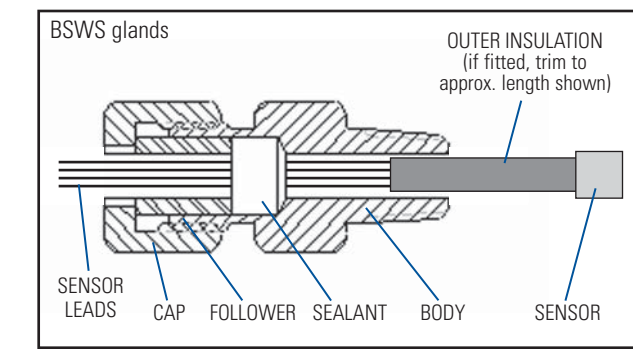
2. Install the sensor securely into its housing. Place the gland body over the leads and mount it in the enclosure or bearing housing mounting thread. Slide the sealant over the leads into the gland body until seated. There are individual holes for each lead.

3. Place the follower over the leads and push it into the gland body. Ensure that the wires are correctly positioned.

4. Place the cap over the leads, screw on and tighten it to the specified torque shown in the Torque table for the size of gland used.

TORQUE TABLE (Nm) – BSWS GLANDS

Sealant	V
BSWS4	4.08 - 6.80
BSWS5	16.3 - 24.5



WIRE SIZE CONVERSION TABLE

The data provided in the following table applies to single core solid drawn wire without insulation.

Specifiers using wire sizes other than AWG may determine the nearest equivalent wire size, within permissible limits of tolerance, by reference to the table, e.g., 0.5mm² wire size is equivalent to 20 AWG.

Where it is intended to use elements of equivalent od. in place of wire in certain types of glands, the diameter of the element may also be determined from the table. e.g., 18 AWG wire may be substituted with an element 1.0mm (0.040") diameter. *Caution: When calculating equivalent element sizes for PL glands, allowance must be made for the thickness of the Kapton insulation. Refer to page 21, Note 2.*

AWG	OD (mm)	mm ²	OD (in.)	AWG	OD (mm)	mm ²	OD (in.)
8	3.26	8.80	0.1285	22	0.64	0.32	0.0253
10	2.59	4.65	0.1019	24	0.51	0.21	0.0201
12	2.05	3.16	0.0808	26	0.40	0.13	0.0159
14	1.63	1.93	0.0641	28	0.32	0.081	0.0126
16	1.29	1.30	0.0508	30	0.25	0.051	0.0100
18	1.02	0.82	0.0403	32	0.20	0.033	0.0080
20	0.81	0.52	0.0320	34	0.16	0.020	0.0063

CONVERSION FACTORS

Temperature

To convert °F to °C: $^{\circ}\text{C} = \frac{(^{\circ}\text{F} - 32) \times 5}{9}$

To convert °C to °F: $^{\circ}\text{F} = \frac{(9 \times ^{\circ}\text{C})}{5} + 32$

To convert °K to °C: $^{\circ}\text{C} = ^{\circ}\text{K} - 273.15$

To convert °C to °K: $^{\circ}\text{K} = ^{\circ}\text{C} + 273.15$

Pressure

To convert psi (lbf/in²) to bar: bar = psi x 0.0689

To convert psi (lbf/in²) to Pa: Pa = psi x 6894.76

To convert bar to psi (lbf/in²): psi = bar x 14.5

To convert Pa to psi (lbf/in²): psi = Pax 0.000145

To convert Pa to bar: bar = 1 x 10 Pa (1 mbar = 100 Pa)

Torque

To convert ft/lb to Newton metres: Nm = ft/lb x 1.36

To convert in/lb to Newton metres: Nm = in/lb x 0.113

To convert kg/cm to Newton metres: Nm = kg/cm x 0.098

To convert Newton metres to ft/lb: ft/lb = Nm x 0.738

To convert Newton metres to in/lb: in/lb = Nm x 8.85

To convert Newton metres to kg/cm: kg/cm = Nm x 10.2